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THE PHYSIATRIST AND RESEARCH IN PHYSICAL MEDICINE *

H. WORLEY KENDELL, M.D.

Professor and Head of the Department of Physical Medicine

University of Illinois, School of Medicine

CHICAGO

It is with deep appreciation that I accept the honor of becoming the President of the American Congress of Physical Medicine on its twenty-fifth anniversary. On this occasion I should like to direct my remarks to the physiatrist, the physician who practices the specialty of physical medicine.

"Physiatrist," the designation for the physician who employs physical agents in the treatment of his patients, is a relatively new term in the medical world, to the layman and even to this audience. The Council on Physical Medicine of the American Medical Association agreed to sponsor the term as the designation for the physician specializing in physical medicine. The first public announcement to the medical profession appeared in the May 4, 1946, issue of the *Journal of the American Medical Association*. In March of this year, one of our colleagues read a paper before the staff of the Army Medical Center, at which time he stated, "It is gratifying to announce that with the approval of the American Board of Physical Medicine has come the complete recognition of physical medicine as a specialty." The author further stated that his presentation might well have been entitled "the birth of a specialty."

With the birth of the specialty, physical medicine, came the birth of the symbiotic infant, the physiatrist. It is not uncommon to select a name for a baby before it is born or even, in many instances, before it is conceived; therefore naming the child "the physiatrist" before its birth did not violate the common laws of civilized practice. Due credit must be given to you, its parents, who have been preparing for this event for many years. Also the assistance given by organizations such as the governmental services, Army, Navy, United States Public Health Service and Veterans Administration; our universities and clinics; national foundations, such as the National Foundation for Infantile Paralysis, Inc., and private endowments, such as the generous gifts of Mr. Bernard Baruch, all have contributed to make this event possible. Special mention should be made of the occupational and physical therapists and their organizations, who have contributed immeasurably; their assistance in furthering a more integrated program of their activities for the future of physical medicine is appreciated. But now that the physiatrist has been born, it is your duty and responsibility as parents of future physiatrists to prepare them to promote the development of the field of physical medicine so that it will unequivocably take its place as one of the outstanding medical specialties.

It is perhaps presumptive and a sign of an oncoming intellectual menopause for one to endeavor to lay down certain precepts for success in this field. It is probably fortunate that every one prefers to learn to make his own way, even though it be the hard way. Be that as it may, as I look around at our colleagues who have attained success in the field of physical medicine and analyze carefully the methods that they have used, I see certain

* Presidential Address delivered at the Twenty-Fifth Annual Session of the American Congress of Physical Medicine, Minneapolis, Sept. 3, 1947.

things which may be worth recommending to you as parents of future physiatrists; and as I look farther, especially into my own past, I see certain "don'ts" which may be equally worth noting as practices to be avoided. Some of these observations may, in my opinion, have an influence on the success of physical medicine and the development of the physiatrist. This child needs careful guidance during its earlier years, and it is your responsibility as its parents to shoulder this obligation. It is hoped that it may reach a precocious maturity without the scars of congenital deformities or the sequelae of infantile diseases; but this desire will not reach fulfillment without hard work.

The Physiatrist

The physician who plans to specialize in physical medicine must be born with a good intellect, but it is not necessary that he have the I.Q. of a genius. Oliver Wendell Holmes divided minds into one-story intellects, two-story intellects and three-story intellects with skylights. He further stated that all fact collectors who have no aims beyond their facts are the one-story men. The two-story men compare, reason, generalize and use the labors of the fact collectors as well as their own. The three-story men utilize, imagine, predict; their best illumination comes from above, through the skylight. We see the same types among our colleagues, and all three have their places in the field of physical medicine. All of us know the data collectors, who fill the literature with amorphous data but do not tell us what the data means, and we can look around us and see a few three-story intellects with skylights. It is often unnecessary for the highest intellects to do any collecting of data; they can take the published observations of other investigators and marshall them to support some new conclusion. It is important, further, to emphasize that there may be a fortuitous combination, too, of one-story with three-story intellects; and examples of this combination can be readily found in the annals of medical history. But there is a real danger of having more mind than matter, of having so many ideas that one flits from one problem to another without ever completing anything. After perhaps years of flitting, the intellectual genius wakes up and finds that an intellectual friend who has had but one thought has proved some truth beyond any possibility of doubt, while he himself has had innumerable theories, all of which still remain theory.

It is important that the present-day physiatrist, if he is to succeed and develop and broaden the field of physical medicine, have an inquisitive mind. Some people can look at a problem and never see that it is a problem. Of equal importance with an inquisitive mind is the quality of not being easily frustrated. Charles F. Kettering once aptly stated: "If everyone could get off the boat and walk home during a storm, no one would ever cross the ocean." Hence if we are to succeed — and not only succeed but attain the highest recognition for the field in the shortest time — the countless storms that will beset us must be coped with as quickly and effectively as possible and without interference or damage to the boat itself. It is also important for the inquisitive mind to ask questions, for this is the most expeditious way to learn the answers; physicians who have gained success have not been hesitant in asking questions. The successful physiatrist must be ambitious, for ambition breeds energy. Moreover, since the scope of physical medicine has been broadened to include the total medical rehabilitation of the patient, the physiatrist must be prepared to direct and assume responsibility for the psychosocioeconomic factors in the patient's recovery. The rapid development of this phase of physical medicine will be enhanced if the necessary medical direction is given to the established field of occupational therapy. For

sustaining the whole field and developing it into a much broader and definitive field intensive research work will be required, which will come only through labor, sweat, blood and tears.

Research in Physical Medicine

Research in physical medicine is the medium through which this specialty will remain in the foreground and through which it will become firmly established among the medical specialties. It is our individual and collective responsibility to see that research programs are developed in our field, whether we participate actively or lend mental, physical or financial assistance. Physical medicine will remain highly empirical until much advance has been made in our understanding of the interaction of temperature, light, electricity, magnetism and penetrating radiations on tissue and cellular systems. The reduction of the physical forms of therapy to a truly scientific basis must inevitably come late. Unfortunately, we do not have an Aladdin or his genie to do this job for us. Many theoretical and experimental battles of biophysics and biochemistry must first be fought and won. This is not to say, however, that the effectiveness of present-day methods employed in physical medicine cannot be greatly increased by the application of well known physical principles. Although the basis of such therapy may be empirical, it is at least possible to devise methods of measurement of the energy dissipated and the probable locus of its dissipation.

The ideal pattern for research in this field has not been devised; however, it is believed that the approach now being used for successful instrumentation may be a practical solution. Here, a predesigning or at least an estimate of the expected order of magnitudes to be measured is almost always required, and application of a similar method in physical medicine seems particularly promising. The aim of research formerly was the unbiased collection and observation of natural phenomena. Many research programs can be set up in such a way, but the effectiveness of such research is rather limited, particularly with more complicated problems. The mere observation is frequently unsatisfactory, leading to a plethora of observed phenomena that can never be mastered by one man's brain. Only by classification and grouping according to theoretical considerations is it possible to obtain a unit of concepts that can be embraced by a single observer and can lead to practical applications of general significance. Consequently, the modern research process is different; it is usually initiated with a theoretical consideration which follows deductively from known facts, and this hypothesis is then proved by experiments. It is obvious that under such conditions individual observations will receive varying weights. Not every result will be accepted as an observed phenomenon, the observer rejecting some results as they are modified by secondary phenomena. This distinction is of greatest importance when the clear line of basic research is to be followed, a necessary consideration in physical medicine.

Originality is an important asset to any one engaged in research. One can possess the best of intellects and still be a failure in research because of a complete lack of originality. I do believe that the prospective research worker or his advisers can tell without a practical test whether this important but intangible quality is present. I am also not sure that originality can be acquired, but in my opinion a well developed ability to correlate ideas may almost take its place. It is important for one engaged in research to stop, look and listen at every opportunity when any new and interesting fact is being discussed. He should ask himself whether this fact has any bearing on his problem, and it is surprising how often some connection may

be found. The final result may have the appearance of original thought, but often, as a matter of fact, it is the logical outcome of the process of correlation.

We all agree that financial backing for research is extremely important, but the ideal backing leaves the investigator free to pursue whatever project seems most promising. It is important that the man and not the project be endowed. His natural interests may take him around Robin Hood's barn, but it is characteristic of all research that when the goal has been reached successfully the course from the starting point to the finish tape is never a straight line. The worker should be alert to development in fields remote from his own, for such developments may be utilized in a given situation, even though they originated in an entirely unrelated situation. As is true of most problems, a research problem which has once been solved appears simple, no matter how complex it seemed before.

One should not hastily select the first problem that presents itself; it should be remembered that there are just as many opportunities and problems today as there were a hundred years ago and will be a hundred years from now, and it should also be remembered that it is much easier to start an experiment than to finish one. Well planned programs — particularly programs that have been well thought through — bring rewards. It is important that one always be in a position to discard a problem if that is indicated, regardless of the time already spent. One should not be hesitant in admitting mistakes. It should also be remembered that analysis and investigation of a subject which produces negative results may be just as important as study of a problem that brings glory, fame and publicity to those associated with it. The problem should be scrutinized from all points of view. It should not be studied with the electron microscope when first presented; the entire field should be covered with a low power lens, and then when some point of interest presents itself a high power lens may be used.

"Lone wolf" investigation in physical medicine is to be discouraged. The investigator who never discusses his results with others and who never invites criticism is a person who not only loses the happiness and fun associated with the work but retards his own progress. Most problems are complex enough to require the combined efforts of a group for their successful solution. Of particular importance is the careful integration of the project with biochemistry, physiology and biophysics. It is high time that the importance of the biophysicist in the field of physical medicine be recognized; one may say that physical medicine is applied biophysics. The sooner departments of physical medicine recognize the importance of the biophysicists and provide permanent positions for them on their staffs equal to or better than those in the departments of biophysics, the sooner will there be ideal research teams. The collaboration must be entirely voluntary and natural rather than imposed.

Some investigators hesitate to discuss their work because of the fear that some one else will pirate the results and rush into print to claim priority. However, the danger of having intellectual property pirated is more than offset by the valuable suggestions received from one's colleagues. Any one can cite numerous articles which have appeared in print with serious shortcomings which could have been eliminated by permitting colleagues to review the manuscript before publication. Once an article is in print, mistakes cannot be eradicated. Knowledge usually accrues in a logical manner; material which is rushed into print for the sake of priority is usually from a one-story intellect trying to be a higher intellect.

Accurate measurements are imperative; science is based on measurement. The problem is what to measure and how. One should make meas-

urements to solve the problem, not look for a problem which will be an excuse for making certain complex measurements. Physical instrumentation in medical research will add considerable to the development of physical medicine from a science of empiricism and qualitative observation to one of quantitative observation and measurements which form a basis for analysis and theory. One may say that the development of the theoretical basis of physical medicine is largely a question of biophysical research and the development of the necessary instrumentation for it. Medical instrumentation as it is being developed might better be defined as methodology, the science of research methods. This term places emphasis correctly on the method and the principle rather than on the instrument. Instrumentation as such is an auxiliary science in medicine in about the same way as mathematics is an auxiliary science for physics, and, like mathematics, it frequently influences the character of the research. The purpose of an instrument is, in general, to determine a physical magnitude quantitatively, and the correct use of an instrument, therefore, forces the research worker to express his problems in fundamental physical magnitudes. This is important from the fact that limitations to few, but usefully chosen, magnitudes has contributed to the rapid development of the physical sciences.

One should not be fooled by figures. Granted that figures do not lie but that liars do figure, the fact remains that figures can give one a false sense of security, no matter how careful one is in research methods. In almost every experiment unanticipated variables may creep in and may account for the changes observed.

The careful collection of data and the jotting down of information at the time that it is noted are of extreme importance in the end result. All observations should be recorded, no matter how insignificant they may seem. Then a theory should be developed and the observations correlated with the sum total of that which is known. But one should keep an open mind with regard to the theory; if new facts present themselves which necessitate a change in the working hypothesis, the change should be made. The purpose of the working hypothesis is to provide something around which facts can be marshaled and which can be revised and replaced with a better theory. One should not be offended if some other investigator changes the theory, provided the facts on which the theory is based are correct.

Often a promising project is interrupted because some one with a bank account wants to know the answer to some specific problem immediately, even before work on the problem is started.

One should not be too greatly disturbed at pressure exerted upon one to produce tangible results, papers and reports. Often there is too much pressure to produce results, and such pressure may have its drawbacks; but it may also be a blessing in disguise. Nearly every one has a certain amount of inertia about working up his data. Not infrequently one's best thoughts come out only when one attempts to put down the findings in black and white; too often only then does one realize the shortcomings of the data.

In ideal circumstances research should not be mixed with other jobs. One who plans to do research should make up his mind in the beginning that he will be satisfied in doing the work itself without executive responsibility. As has been said, the desk of a good executive should always be clear but that of an investigator should always be littered. It is important that one reserve some time each day for clear thinking. Some persons think better when engaging in routine activities, but, wherever the thinking is done, one should have time to put the facts that have come before the sensorium in close apposition to the old problems.

When the door of success in research is reached, it may still need a suitable key to unlock it. In my opinion, this key is often the overworked term "personality." Every one admits that this intangible factor is of great importance in any person's success; it is particularly true of the physiatrist striving to attain success in his field. One may object that personality does not count in pure science. The objection may be valid, but at the present time physical medicine cannot be regarded as a pure science; and until the physiatrist succeeds in making physical medicine a pure science, the key of personality will be important.

Summary

The birth of the specialty of physical medicine has come with the granting of the American Board of Physical Medicine, and with its birth the physiatrist, the practitioner of the new specialty, is charged with the responsibility of guiding it through its formative years. He must have a good intellect, inquisitiveness, ambition and wide training, and he should recognize the importance of research in the field, to enable it to attain and maintain its rightful place among the longer-established specialties.

THE USE OF ELECTROMAGNETIC INDUCTION FOR THE STIMULATION OF NERVOUS TISSUE IN INTACT ANIMALS *

ROBERT D. TAYLOR, M.D.

CLEVELAND

There are many large areas of the brain whose functions are unknown or poorly understood. This is made manifest by the 605 page monograph "The Precentral Motor Cortex," edited by Bucy.¹ In spite of the fact that this part of the brain has been studied longer than any nervous tissue, there are many important points concerning its function which are unsettled. Investigation is limited by methods which require exposure of the brain and observation of motor responsiveness or those measurements recorded by the electroencephalograph and oscillograph. During studies designed to explore the role of the central nervous system in the genesis of arterial hypertension, a procedure for stimulation of the pressor center of the medulla of dogs was developed which may be useful in other neurologic investigations.

Methods

Healthy mongrel dogs were used. They were anesthetized by the intraperitoneal or intravenous injection of 35 mg. of pentobarbital per kilogram of body weight. The floor of the fourth ventricle was exposed through a midline incision extending 8 to 10 cm. downward from the occipital protuberance. The occipital bone was removed upward from the foramen magnum. Incision of the dura mater and pia arachnoid and

* From the Research Division of the Cleveland Clinic Foundation.

* Read at the Twenty-Fourth Annual Session, American Congress of Physical Medicine, New York, Sept. 4, 1946.

¹ Bucy, P. C.: The Precentral Motor Cortex, Illinois Monographs in the Medical Sciences, Urbana, Ill., University of Illinois Press, vol. 4, Nos. 1-4, 1944.

retraction of the cerebellum exposed the ventricular floor. The pressor area as described by Ranson and Billingsley² was outlined by electrical and mechanical exploration. The area which gave the greatest pressor response was selected as the vasopressor center. It was located on either side of the median sulcus and extended 3 cm. cephalad from a point of 2 mm. above the obex.

After the area was outlined, a tantalum wire 3 mm. in length was inserted just below the brain surface along the median sulcus. This procedure was carried out on 7 dogs. After recovery periods of five to ten days the animals were again anesthetized and connected to a mercury manometer which recorded the blood pressure. A protective coating of towels 5 to 6 cm. in thickness was wrapped about the dogs' heads. The coils of a General Electric Inductotherm were then applied to the head. Stimulation adequate to induce a rise in blood pressure most consistently resulted from application of maximal intensity of the induced heat for ten to twenty minutes. Two animals were trained so that the experiment could be carried out while they were conscious. Control observations were made on 4 normal anesthetized dogs.

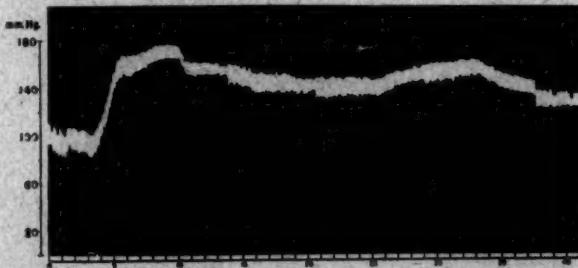
Results

None of the 4 control animals showed a change in blood pressure while the head was being heated. However, in each of the 20 experiments done on the 7 animals with tantalum wire in the region of the vasopressor center, a rise in blood pressure was observed.

During the initial experiments on each dog a sharp rise in pressure occurred. It varied from 24 to 70 mm. Hg (average 38 mm.) above control levels (table 1). The duration of response varied from 2 to 5 hours (mean

TABLE 1.—*Initial Blood Pressure Response to Stimulation of Vasopressor Center by Heat Induced in Tantalum Wire.*

Dog No.	Days After Operation	Control Blood Pressure, Mm. Hg	Maximum Rise, Mm. Hg	Duration of Elevation, Min.
120	12	164	40	120
164	14	100	70	150
185	10	120	36	240
116	9	118	28	230
184	12	120	24	160
250	6	146	38	300
91	7	116	30	240
Average	10	126	38	206



Blood pressure curve of a dog with tantalum wire in the region of the vasopressor center during heating of the head by inductothermy.

206 minutes). Usually the pressure began to rise 4 to 6 minutes after the beginning of the experiment and slowly reached its peak after 10 to 20 minutes. Such increased levels were sustained for 1 to 2 hours. Occasionally blood pressure was above the control values for as long as 6 hours. During the last 3 to 4 hours there was a steady decline in pressure. The result of the most striking experiment is illustrated in the chart.

As experiments were repeated on these dogs, it became evident that pressor responses were of a lesser degree.

² Ranson, S. W., and Billingsley, P. R.: Am. J. Physiol. 41:25, 1916.

After three months 3 of the dogs were killed. The wire was found embedded in a firm coating of tissue three to four times the thickness of the

TABLE 2. — *Subsequent Blood Pressure Response to Stimulation of Vasopressor Center by Heat Induced in Tantalum Wire.*

Dog No.	Days After Operation	Control Blood Pressure, Mm. Hg	Maximum Rise, Mm. Hg	Duration of Elevation, Min.
120	26	150	14	60
120	42	140	14	60
164	30	104	18	60
164	46	118	14	30
185	18	104	34	60
185	30	114	18	90
116	16	144	16	30
116	32	126	20	30
184	22	114	15	50
184	36	108	10	40
250	10	130	20	60
91	14	120	12	30
91	21	110	14	40
Average	29	122	21	49

metal. This insulation probably developed as a result of local tissue damage and could account for the diminishing effectiveness of the stimulus.

Comment

These experiments demonstrate that a vasopressor area of the medulla may be repeatedly stimulated by the implantation of a small piece of tantalum wire and the induction of heat in it by the external application of the Inductotherm. Thus, a method is provided which may have wider application in the exploration of the physiologic functions of the central nervous system. Limitations of the method reside largely in the fact that a tissue reaction occurs about the wire with the result that the stimulation gradually decreases in intensity. Still, over the weeks or months while this is occurring a period is available when the disturbances elicited may be satisfactorily studied.

Summary

A bit of tantalum wire was placed in the region of the vasopressor center of 7 dogs. Heat generated in it by means of the Inductotherm caused sharp and prolonged rises in blood pressure.

ADMINISTRATIVE ASPECTS OF RECONDITIONING PROGRAMS

RICHARD W. LIPPMAN, M.D.*

SAN FRANCISCO

One of the fundamental contributions of war medicine to society has been the concept of reconditioning which directed the profession's attention to the scientific management of convalescence. Prior to the war, there had been little organized attention given to this most important phase of medical management. There were rudimentary ideas developed historically, and a skeleton program of reconditioning was started in connection with medical services during the First World War. Recent years have seen some developments in the field of rehabilitation. Services of this nature have been established in many states, aided by grants from the federal Office of Vocational Rehabilitation. However, the war, with its tremendous pressure for the development of rapid mass methods for restoring men to health as completely and as rapidly as possible, first brought the application of systematic thinking to the problems of all ill persons from the time they became disabled until they were returned to maximum usefulness.

Perhaps it would be well at the outset to distinguish between two terms which are frequently confused: reconditioning and rehabilitation. By the latter is meant the process by which a patient who has recovered physically from an illness or injury but has been left with a residual disability is restored to the maximum degree of physical capability and social usefulness. An example is the service afforded in providing a hand amputee with a prosthesis and teaching him its use in a new occupation. Reconditioning is a broader concept which covers the entire field of convalescence management. In fact, it is the process of managing convalescence in such a way as to decrease length of time lost from useful work, and to prevent regression in skills; it uses the time of convalescence constructively in adapting the individual to his place in society and in helping him to adapt society to his own needs.

It will not be my object here to describe the methods and goals of reconditioning in detail. That has been done previously in other places.¹ More details concerning methods are available in War Department publications.² The fundamental objective of a reconditioning program is to return patients to usefulness as quickly as possible in the best possible physical and mental condition. Reconditioning attempts to fill the great void which has existed between the definitive control of a disease process or injury and the attainment of maximum improvement or cure and return to ordinary living.

The significance of this new approach to medical care is great, especially when considered from a social and economic viewpoint. By far the greatest proportion of time lost from productive activities by patients with most diseases or injuries, is spent in convalescence. This is true of surgical patients, who become convalescent after completion of definitive operative procedures and may continue convalescent for prolonged periods. It is equally true

* Formerly of Reconditioning Service, Bushnell General Hospital, Brigham City, Utah.

(a) Rusk, Howard A.: Convalescent Care and Rehabilitation in Army Air Forces: New Challenge to Postwar Medicine, *M. Clin. North America* 29:715, 1945. (b) Lippman, Richard W.: Reconditioning: The Management of Convalescence, *New York State J. Med.* 46:2421, 1946. (c) Lippman, Richard W.: Medical Implications of Convalescence, *Arch. Phys. Med.* 27:477, 1946.

2. War Department Technical Manuals: TM 8-290 (Educational Reconditioning), TM 8-291 (Occupational Therapy), TM 8-292 (Physical Reconditioning), TM 31-205 (Special Services Officer).

of medical patients, who become controlled after a period of specific treatment and then enter a convalescent phase.

Reconditioning attempts to deal with convalescence, as just suggested, by a variety of modalities. It provides physical activities to promote general fitness, as well as accelerated recovery in affected parts. These are divided into physical reconditioning activities (including sports, corrective exercises, selected and adapted calisthenics) and occupational therapy. Physical therapy is another category of means for accomplishing the same ends. Historically it has been separated from reconditioning in military installations. However, the trend has been to unite the services of physical medicine with those of physical reconditioning in civilian institutions. Reconditioning also provides educational activities for the convalescent patient. These should include guidance (vocational guidance and aid in solving personal problems), prevocational exploration (in conjunction with occupational therapy) and formal and informal academic education. Finally, reconditioning should be charged with the responsibility for developing a coordinated and constructive recreation program.

Administrative Structure of a Large Reconditioning Service

It is essential to recognize reconditioning as a medical activity which must be supervised by medical personnel. Management of convalescence is part of the treatment of disease or injury, and, as such, must be governed by medical judgment.

In large hospitals of the armed forces, this fundamental proposition was recognized by creation of a reconditioning service, on the same professional and organizational level as the medical and surgical services. Owing to the emergency situation and the shortages of professional personnel, it was not always possible for the position of Chief of Reconditioning Service to be occupied by a physician. However, this makeshift was recognized as such, and where a properly trained and oriented medical officer was available the service prospered accordingly. In addition to the advantage of better medical integration, the medical officer in charge of reconditioning activities had greater influence upon the other professional services and made acceptance of this new idea more readily achieved.

The Reconditioning Service was subdivided into three sections: Physical Reconditioning, Educational Reconditioning and Occupational Therapy. The names are descriptive of functions of the sections. Experience has shown me that this structure, while superficially adequate, had fundamental deficiencies. Efficient administration of any program requires the grouping of all overlapping functions in an organization, in order to prevent duplication of authority, effort and facilities. For example, recreation is a necessary part of a reconditioning program and may form a constructive part of convalescence activities. In the service hospitals, recreation activities were divided between the Reconditioning Service, the Red Cross and the Special Service Section. Guidance activities were a necessary part of the Reconditioning Service, yet were also provided by the Classification-Counselling Section, associated with "separation from the service."

Locally, the need for greater grouping of services and of authority was often seen. In such cases, the Chief of Reconditioning Service was sometimes placed over the related activities in a supervisory capacity. However, the coordination was always hampered by divided responsibilities.

On the basis of experience in a program which served a 2,200 bed hospital, it seems advisable to me that reconditioning service should be organized with respect for these fundamental ideas: the service should be a professional one, headed by a physician, with status equal to that of medicine and

surgery; all related activities should be grouped in this service. In this grouping should be included physical medicine (physical and occupational therapy), physical training, educational activities (including guidance), social services and all recreational activities.

Special Problems in the Large Hospital

The problems of a reconditioning service revolve around the same axis as all other hospital problems. They concern financial support, space, personnel and the general orientation of other services and personnel toward the concept of convalescence management. However, the special nature of the service, especially the novelty of the idea, give an individual flavor to the considerations.

The medical profession is bound by tradition. It is properly conservative in its attitude toward new concepts and modes of therapy, as befits a profession that deals in human lives. The physician is habituated to a supreme authority over his patients. He is accustomed to make rounds at his convenience and to find patients available for examination and consultation, without much regard for schedules. The nurse, in turn, is accustomed to minimum interference with ward routines from outside sources. These factors have combined to create a skepticism toward reconditioning in professional circles. Add to these factors an unhappy experience in a hospital in which the program was not very successful or in which the reconditioning personnel were not properly trained and did not properly recognize their relation as adjuncts to medical care, and hostility was created.

It is of basic importance that the chief of a reconditioning service should be enthusiastic, of recognized professional competence as a physician, and indoctrinated with the objectives and methods of reconditioning. He should take an active part in all professional activities of the hospital, including conferences. He should give periodic lectures and demonstrations of the facts concerning reconditioning to the physicians, nurses and attendants. As an adjunct to treatment, reconditioning can succeed only with the understanding and cooperation of the other professional services. It must make the other services recognize that reconditioning is there to help them with their problems of management. In introducing a reconditioning program into a hospital, the first task is to sell the idea.

Personnel for a department is the next prime consideration. One cannot build a program on a solid basis without properly trained personnel. Reconditioning methods and technic were developed into specialized procedures in the armed services. Courses in educational reconditioning and physical reconditioning were given, for example, at the School for Personnel Services, Washington and Lee University, Lexington, Va. There selected physicians, administrative personnel and enlisted technicians were given intensive courses lasting one month, covering the rudiments of principles and an analysis of existing experience. Although necessarily too brief, these courses were of inestimable value in that they furnished a basic approach and a fundamental store of references and they convinced the personnel that their mission was a valuable one. It would be a tremendous aid in the establishment of reconditioning programs if a foundation, such as the Baruch Committee on Physical Medicine, would establish an institute for the proper training of specialized personnel. With the contraction of programs in the armed forces, their schools have closed, and no place exists which provides over-all training for reconditioning work.

In recruiting personnel for reconditioning programs, there is no doubt that the best talent available at present is Service trained. Many physical and educational reconditioning instructors were trained at the Service schools

and then had service in well run programs. These people have acquired practical knowledge of problems and accomplishments. Physical reconditioning instructors should preferably have a background in physical education. The best instructors were college graduates in the field. Additional training is necessary in order to convey an understanding of patient psychology and the special adaptation of exercises necessary for patients with physical limitations. Educational instructors should be young, with good educational background but without any tendency to academic pedantry. They too need additional training in patient problems. Counselors for the guidance program should be experienced in vocational and personal guidance. In special hospitals with a concentration of patients with similar disabilities, it is preferable to use as instructors persons who have conquered the same handicaps as those with which the patients are faced. Thus, in an amputation center in the service, we were most successful when we used amputee ex-patients to teach the various rehabilitation courses.

The next major consideration is space. Most present-day hospitals were constructed long before any attention was being given to the management of convalescence. Physical therapy and occupational therapy departments, developing largely within the last few years, have been hard pressed in finding sufficient space to operate. In most hospitals these services are relegated to left-over spaces which barely suffice to meet minimum needs. Reconditioning, however, includes more than these two sections and needs correspondingly more space. As a matter of fact, in a 2,200 bed hospital in which most of the patients were suitable for an active part in the reconditioning program the reconditioning service was allotted several of the army general hospital type buildings, and constantly felt the need for more. There is nothing to be accomplished by a defeatist attitude. Of course, limitation of space will limit the program. The hospital cannot expect as much from a service with inadequate facilities. But something can be done in any space. If less space is available, the service should orient itself toward more ward activities and the use of portable equipment. In future construction, reconditioning needs should be considered.

Certain other considerations concern the use of existing space. The nature of ward space is particularly important to the success of a program. Group activities require some concentration of beds in open wards. The presence of partitions, cubicles and side rooms, hampers the conduct of group games, classes and physical training. Motion pictures in the wards, a valuable adjunct to recreation and education, are shown with great difficulty if wards are constructed with many obstructions to vision. Partitions require that activities be repeated many times to reach all the patients, and this, in turn, rapidly multiplies the number of personnel needed for the program. Of course, a balance must be found between the necessity for isolation, personal privacy, care of the seriously ill and the reconditioning program. Another important factor in the use of space is proper scheduling. This is particularly true in the wards. As I indicated before, a reconditioning program can be successful only by becoming an adjunct to medical treatment with the full cooperation of medical staff, nurses and attendants. Proper scheduling can permit ward activities by groups, without seriously interfering with meals, ward routines, rounds and other necessary events.

Finances for the program are important. Basic needs may be approximated from previous experience, and from lists of equipment prepared by the armed services for hospitals of various sizes. I cannot overemphasize the importance of one factor: a reasonably large flexible fund should be available to the chief of service for the purchase of nonstandard supplies and

expendable supplies, and for the satisfaction of unanticipated needs. Reconditioning as a concept is new. Enough experience to predict all needs has not been accumulated. Tastes of the patient population change from time to time, requiring changes in the equipment and opportunities offered. The hospital should have enough confidence in its chief of service to make available to him funds that can be used in a flexible way to satisfy these needs without extensive administrative delay.

Finally, the program must be sold to the patients. The services and facilities afforded to patients should coincide with their needs and desires as closely as possible. The best way of achieving this end is to conduct a patient survey ascertaining educational and recreational interests. These will vary in different sections of the country, with age, types of illness and many other factors. An actual survey is the best way to find out in your hospital. Patients should receive on admission an attractive booklet describing the reconditioning program. Incidentally, this vehicle may transmit much other valuable information about the hospital. It should be written well and simply, with no pretensions. Patients should further receive an interview from a counselor as soon as they are deemed fit to participate in the program and at that time be definitely enrolled in prescribed activities. Enrollment should proceed at medical request or subject to medical approval.

Even in the most favorable circumstances, patients may be reluctant to participate in the program at first. This may be due to the intellectual inertia which often accompanies illness and convalescence, or it may be due to a negativistic attitude which is found in certain patient groups, such as military patients. In the latter case, the negativism is a reaction to military authority. In service hospitals, reconditioning activities were made mandatory. The program was regarded as treatment, and refusal of reconditioning was considered equivalent to refusing medication or operation. Where this policy was followed reasonably and where the patient was given a wide and attractive choice for the specific activities required, excellent results were obtained, and patients leaving the hospital were usually convinced that the program had been of considerable benefit to them.

Adaptation of Reconditioning Programs to the Small Hospital

Most of the previous remarks have been predicated on the assumption of a large hospital (over 500 beds) with a patient population suitable for extensive reconditioning procedures. A well rounded program which uses to advantage all the available knowledge of reconditioning requires a rather large patient population for economical operation. Many of the facilities and activities need specialized equipment. Shops for prevocational training are essential, as well as classroom space, specialized personnel and instruments. Clearly, this requires a patient population large enough to provide a steady demand for the use of such specialized materials. It might be remarked parenthetically that this constitutes another argument for the desirability of special hospital centers for the treatment of related diseases and injuries, in conjunction with general hospitals. This would permit the development of special reconditioning apparatus and procedures as well as the growth of special skills and other medical technic.

Nevertheless, there is a great deal that can be done on a less ambitious level.³ The same general principles should be followed: medical supervision and consolidation of overlapping services. One good start is the consolidation and organization of recreation services, using the concept of patient participation as much as possible.

3. Lippman, Richard W.: Hospital Convalescence Management, Amer. J. Surg. 79:638, 1948.

Hospitals with limited facilities and funds can accomplish a great deal by full utilization of community facilities and service organizations. Schools and colleges located in the vicinity of a hospital may frequently be persuaded with ease to contribute teachers and materials for the conduct of classes. Local artists and other professional men and women may likewise be induced to hold educational features on a regular basis. Museums and institutes of all sorts constitute other fertile sources of intellectual instruction which may be afforded to patients. Trade unions may conduct vocational orientation sessions of real value.

Motion pictures shown in the wards may prove useful in an educational program, as well as for recreation. Such pictures should be shown on a regular schedule, preferably by paid personnel rather than volunteers. There are now available portable units, mounted on wheels, with built-in screen and projector all in one. These are so constructed that they may be used in daylight simply by dimming the room or keeping them out of direct daylight. Once the film is loaded in the machine, operation is entirely automatic, except for start and stop buttons, and the picture will repeat itself when the machine is restarted. These machines were developed for use in military hospitals and are of great value because they may be operated with a minimum of trained personnel. In the average small hospital, one operator could handle several machines on a staggered schedule, as after loading he would be present only to start and stop the machine and move it between shows. Pictures should be carefully chosen to satisfy the educational objective or entertainment tastes of the audience.

It is desirable to group patients with similar capabilities and cultural levels as much as possible. This makes it easier to arrange group entertainment or educational activities on a ward basis. Of course, this principle must be modified by medical necessity, but for reconditioning purposes the most homogeneous grouping of patients is most desirable. In addition, this permits introduction of the element of competition into all types of activities, always an efficient incentive if competitors have similar potentials of performance.

In the armed services, the United States Armed Forces Institute (USAFI) proved an invaluable aid in providing educational opportunities for convalescents. Standard textbooks, correspondence courses and testing materials were obtained from this source. The standards were high and recognized at high school and college levels. In this way, individualized study materials could be provided, which individual hospitals could never have provided alone. It is to be hoped that such an agency may be maintained and that its materials may become available not only to Veterans Administration hospitals and military hospitals, as at present, but to all hospitals.

Although occupational therapy may use complicated devices and materials, it is also possible to have a beneficial program with much less. In a 500 bed hospital, two or three therapists, equipped with a small workshop and with emphasis on good portable carts and a ward centered program, can accomplish much. The therapy should be both functional and diversional. In recent times, occupational therapists and physiatrists have emphasized the importance of functional occupational therapy. Such emphasis is certainly valid. Yet, at the same time, it is not correct to omit or deprecate the value of diversional therapy. The psychologic reaction of a patient to his illness or disability is of great importance in his convalescence, and the value of diversional occupational therapy in creation of a favorable psychologic climate for recovery cannot be overestimated.

Guidance activities could well be undertaken through expansion and reorientation of the social service department. The staff should be expanded to the point that it can assist the patient much more completely than is at present the case. In most instances at the present time, social service is mainly concerned with financial alleviation of the cost of illness and care of the family and with arrangements for convalescence at home or other institutions. An expanded service should have sufficient personnel for each ward, or group of wards, to have an assigned worker who spends full time interviewing and seeking out personal and social problems of the patients. It is not sufficient to wait for the patient to be faced with a problem serious enough for him to ask external aid. The problems must be rooted out and solved, and they should include those requiring all types of personal aid — marriage difficulties, illness in the family, choosing a new vocation — anything which may operate to disturb the patient in his adjustment to illness and recovery.

There is no doubt that a physical reconditioning program is much more valuable when equipment is available and when a gymnasium and swimming pool are at hand. However, the most essential aspects of physical reconditioning are directed at the bed patient and are performed in the ward. One instructor can handle half a dozen wards, more or less, depending on the size and the number of partitions. Certainly two or three instructors could with a minimum of equipment carry on a very adequate program in a 500 bed hospital.

Most important in a small hospital is the selection of personnel. A small staff, well chosen, with initiative, imagination and ability, will find means. As I have mentioned, much can be gained from cultivation of close ties with community educational, fraternal and service institutions and trade unions.

Perspective for Reconditioning

Although a scientific approach to the problems of convalescence is in its infancy, there can be little doubt that it constitutes a significant and permanent addition to the philosophy of medicine. Increasing scientific knowledge and increasing social responsibility have constantly broadened the horizons of medicine. The last century saw the development of bacteriology, hygiene and the concept of preventive medicine as a full-fledged field of medical endeavor. More recently, times have seen the development of psychiatry and the recognition of psychosomatic factors in illness. The scientific study of convalescence is another major field for medical considerations, and it will take its place with the other recognized fields in due course.

The growth of reconditioning and scientific convalescence management has been assured and expedited by the formation of the Baruch Committee on Physical Medicine. Its recent report on the establishment of community centers for rehabilitation indicates the trend toward perpetuation of the advances in management of convalescence made during the war. The report contains many valuable suggestions and detailed information which may be of value to hospitals, as well, in the establishment of reconditioning services.⁴

At a more primitive level of society, the physician was responsible for the classification, diagnosis and definitive treatment of illness and injury. But society has become more complex. The individual no longer constitutes,

⁴ Baruch Committee on Physical Medicine: Report on a Community Rehabilitation Service and Center (Functional Plan), New York, 1946. This report available from the Committee, 597 Madison Avenue, New York 22.

with his family, a relatively self-sufficient unit. Nations no longer can consider their fate apart from the world as a whole. Illness has its impact on society through communicability and through the complex tasks which the individual performs, keeping the social mechanism in good function. A skilled worker, for example, absent from his job because of illness cannot be replaced in a moment. With this change in the complexity and interdependency of society, the physician continually acquires new and grave responsibility. It is no longer sufficient to be called when misfortune strikes and to leave the scene when the disease process is brought under control. The physician is now responsible for prevention, for hygiene, for health education and for advice. His responsibilities are now extended into the period of restoration of social function. The medical profession is beginning to realize, and must realize because it is socially necessary, that: "Your job isn't done till your patient's on the job."

SALIENT OBSERVATIONS ON PHYSICAL MEDICINE IN THE SERVICE *

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The progress of Physical Medicine during the several years of the war continuing on into this postwar period has been no less than spectacular from the standpoint of recognition of the potentialities of this adjunct to medical and surgical practice. The hitherto unusual opportunity of treating and following great numbers of patients with similar disabilities in the various specialty centers has afforded a means of developing and standardizing programs as an aid to their more successful management. The elaborate programs of physical therapy, occupational therapy, reconditioning and re-creation for patients with chest injuries, amputations, peripheral nerve injuries, paraplegia, and the like are a credit to the initiative, ingenuity and resourcefulness of those concerned. The programs conducted at the many convalescent centers by sheer weight of numbers of patients, personnel and facilities present an unparalleled milestone in the progress of physical medicine.

It is perhaps premature to evaluate the impress of physical medicine on medical care during the war, and any conclusions arrived at must await further analysis before they are declared final. It does seem timely, however, to present some salient observations in the belief that further consideration and analysis may be stimulated thereby.

Statistical Analysis

It was my good fortune to witness the progress of activity from the opening to the closure of a military hospital. A statistical analysis of physical therapy during a two and one-half years period of activity is presented as a matter of interest in numbers of patients referred and types of cases treated. Of a reported 13,000 patients admitted to the hospital, 6,468 were

* Read at the Twenty-Fourth Annual Session of the American Congress of Physical Medicine, New York, Sept. 5, 1946.

referred at some time or other for physical therapy. In addition, 607 outpatients were referred and 82 others received fever therapy. A total of 241,501 treatments were administered. These were recorded not as visits but as treatments, one treatment being recorded for each modality used.

In this installation, approximately 50 per cent of hospital admissions were referred at some time or other during the two and one-half year period to the physical therapy section. Varying figures have been quoted stating approximate percentages of patients referred for therapy, but unless these figures are given with qualification as to time element, erroneous impressions of volume of work may result. It is important to differentiate daily volume of work and actual number of referrals for treatment over an extended period. For the sake of simplicity, let it be assumed that during a five week period 100 patients were admitted to the hospital and during this time 10 patients were referred and treated and their treatment discontinued each week. It is readily noted that, although 50 per cent of the patients might be referred, only 10 per cent would be under therapy at any one time. The percentage under therapy at any one time fluctuated widely. It was generally lowest with the arrival of large numbers of new admissions, rapidly mounted as cases were worked up and regimens of therapy outlined and slowly receded as patients were discharged.

The table presents an analysis of types of patients referred for therapy.

Summary of Conditions

Condition	No. of Cases	Condition	No. of Cases
Abscess	4	Cyst, branchial	1
Acne	62	Cyst, pilonidal, postoperative.....	6
Acromegaly	1	Cyst, synovial	7
Adenitis	2	Deformities	35
Alopecia	2	Dermatitis	56
Amputation	51	Dislocations	127
Ankylosis	8	Empyema	2
Anuria	1	Epididymitis	7
Arthralgia	3	Epiphysitis	4
Arthritis	325	Exostosis	4
Arthodesis	2	Fibrosis	5
Arthrosis	5	Folliculitis	8
Asthma	7	Foreign bodies, postoperative	4
Backache, undiagnosed	62	Fracture	1,359
Bronchiectasis	7	Furunculosis	7
Bronchitis	5	Gangrene	3
Burns	17	Gonorrhea	67
Bursitis	52	Gout	1
Calcification	3	Graft, bone	7
Cardiac disease	11	Graft, skin	9
Causalgia	2	Hallux valgus	6
Cellulitis	3	Hammer toes	2
Cephalgia	2	Hematoma	4
Coccygodynia	2	Hemiplegia	5
Colitis	3	Hepatitis	3
Colostomy	5	Herniorrhaphy	9
Concussion	2	Hypertension	5
Congenital defect of spine.....	2	Hypertrophy of prostate	1
Contractures	22	Hyperthyroidism	2
Contusion	33	Hysteria	4
Cyst, bone	3	Ileitis	1

Condition	No. of Cases	Condition	No. of Cases
Impetigo	1	Paronychia	1
Int. derang. knee	82	Pelvic inflammatory disease	3
Laceration	16	Peripheral vascular disease	36
Legg-Perthes disease	1	Pes cavus	2
Lobectomy	6	Pes planus	39
Loose joint body	10	Pleurisy	7
Lymphedema	2	Pneumonectomy	4
Malnutrition	6	Poliomyelitis	6
Metatarsalgia	1	Prostatitis	2
Miliaria rubra	2	Psoriasis	8
Myalgia, myositis and myofascitis	108	Psychoneurosis	2
Nasopharyngitis	5	Rheumatic fever	13
Nephrectomy	2	Scar	9
Nephritis	10	Sciatica	42
Nephrolithotomy	1	Scoliosis	7
Neuralgia, neuritis and neuritis	59	Sinusitis	61
Nucleus pulposis	19	Sprain	189
Obesity	2	Strain	97
Osgood-Schlatter disease	2	Sycosis vulgaris	3
Ostectomy	1	Synovitis	73
Osteitis	3	Syphilis, central nervous system	2
Osteochondritis	13	Tendon repair	7
Osteochondroma	4	Tenosynovitis	4
Osteochondrosis	3	Thoracotomy	5
Osteomyelitis	17	Torticollis	9
Otitis media	3	Trigonitis	2
Paralysis, nerve	72	Ulcer, indolent	8
Paraplegia	7	Wound, bayonet	5
		Wound, gunshot	504
		Wound, shrapnel	410

When patients were referred with multiple diagnoses, only those diagnoses for which therapy was administered are listed. In other instances, such as when a man sustained a gunshot wound of the thigh with fracture of the femur and sciatic nerve paralysis, all three diagnoses are listed.

It is apparent that all specialties are represented. As is to be expected, the greater share of therapy was directed to wounds and fractures with involvement of the femur, tibia, humerus, fibula, radius and ulna, in that order, with a scattering of fractures involving practically every other portion of the osseous system. Arthritis was well represented, with most frequent involvement of the spine. Patients treated for internal derangement of the knee comprised those with both operative and nonoperative conditions. In a number of instances instruction for activation of the quadriceps extensor mechanism was requested preoperatively, illustrating the trend toward earlier, intensified physical therapy in orthopedic disabilities. Dermatology was well represented by the skin disorders amenable to therapy with ultraviolet irradiation. An interesting group of patients referred from this section comprised those with dermatitis presumably diphtheroid in origin with a neuritis developing in the hospital many days after the onset of the ulceration, progressing rapidly with segmental sensory and motor loss and followed by complete recovery within six to eight weeks. Frequent muscle tests and tests for reaction of degeneration in a rapidly moving, multiphasic paralysis presented a remarkably interesting opportunity to all therapists for proper analysis and evaluation. It is perhaps of some interest to note that only 5

patients were seen with bayonet wounds, all of which were sustained in the Attu campaign.

Many patients from the medical service were referred for early reconditioning. One cardiologist made the interesting observation that most of the patients with rheumatic fever, after prolonged bed rest, complained of foot discomfort when ambulatory. These were referred for corrective exercise aimed at strengthening the musculature supporting the arches.

It must be remembered that this tabulation represents the type of work performed in one Army hospital and does not necessarily reflect the type of work performed in any other Army hospital. The designation of most hospitals for the definitive care of such specialized work as amputations, neurosurgery, plastic surgery and chest surgery would necessarily reflect an overwhelming preponderance of these diagnoses. It must also be remembered that this tabulation bears no relation to numbers and types of patients admitted to the hospital, since it lists only those referred for physical therapy.

Fever Therapy

The rise of fever therapy with the discovery of increasing numbers of patients with venereal disease who were resistant to the sulfonamides and its abrupt fall with the institution of penicillin therapy present mute evidence of an era in medical progress that will hardly be missed, a feeling which is shared by many colleagues who directed this type of work. Temperatures of 106 F. for a period of eight hours, necessitating an eleven hour period of vigilance, close observation of two intravenous sets dripping at the same time, frightening complications, obstreperous patients, the unfailing loss by transfer of a fever nurse technician just as she finished training—all in conjunction with administration of departments of physical therapy, occupational therapy, and reconditioning, "in addition to other duties"—served to create a period fraught with harrowing experiences and a life-shortening work load. The eternal gratitude of many patients for the long sought cure was, in a measure, most gratifying and largely compensated for the tremendous effort expended. Suffice it to say, however, that patient and doctor are everlastingly indebted to Fleming, Florey and Chain for their discoveries.

Relationship With the Staff

Ample opportunity was afforded to prove that a harmonious relationship with the professional and nursing staff was the *sine qua non* in the successful management of a physical therapy section. Any evidence of poor prescriptive ability could be countered by a tactful consultation concerning the needs of the patient and was always rewarded with intelligent interest on the part of the referring physician. The allocation of appointment time which least interfered with nursing care was rewarded with the highly desired cooperation of nurses and patients.

Casual discussions with technicians assigned to various types of hospital installations lend the impression that direction of a department of physical therapy by a physician with this as a principal duty presents a distinct advantage for all concerned. Most of the technicians appreciated the purpose of notations pertaining to history, examinations and proper instructions for therapy. There was never any doubt that a quick and easily available consultation with the physician in charge was a sustaining bulwark for the puzzled technician. There were also many occasions when members of the staff presented their problems before actual referral of patients in order to secure a better appreciation of the facilities available.

The belief that many of the abuses and misuses of physical therapy are engendered by ill trained or uninterested physicians must be challenged in the light of past experiences. The facilities of physical medicine in military hospitals, superbly equipped and staffed with qualified personnel, could hardly be ignored without deliberate effort. The voluminous and frequent directives pertaining to several branches of physical medicine from higher echelons were an ever-constant reminder to utilize the facilities. It would seem that physical medicine must search its own house for many of the shortcomings. Experience has demonstrated that the greatest utilization of physical therapy can be attained by a repeated, relentless and unremitting amount of missionary work by those directly concerned with the administration of a department. Officer club, post exchange and corridor sessions were a great help to good relations but a constant alertness to the necessity of an educational program, particularly by frequent presentation of suitable material on physical medicine at the professional staff meetings, has proved the most valuable weapon for combating ignorance and disinterest.

The Physical Therapist

The pleasant association with many technicians from all walks of life, from all sections of the country, graduates of most of the approved schools, will remain as an outstanding life-long remembrance of service during the war. As a group, there is probably none which has served with greater devotion to duty, attention to detail, cooperation with authority and sense of responsibility to patient and medical officer. The critical shortage of trained technicians was never entirely relieved during hostilities and for some time thereafter, so that the work load was always heavy and strenuous. All have heard and read of the remarkable degree of resourcefulness and ingenuity at improvisation displayed by technicians assigned to overseas installations, where facilities for physical therapy were often necessarily limited.

Exigencies of war necessitated the accelerated programs of recruitment and training of qualified technicians to supply the acute needs in both physical therapy and occupational therapy. Fortunately, the prerequisite qualifications for admission to the emergency courses were maintained at the former high levels. As was to be expected of all accelerated programs, the qualifications of graduates were noticeably limited in certain instances. It is true that to a certain extent the vast experience during the war served to balance somewhat the deficiencies inherent in accelerated training programs. It must be noted, however, that experience often can serve no good purpose, since "we make the same mistakes a hundred times and call it experience."

It is encouraging to note that most technicians are appreciative of the limitations of an accelerated training program. Initial enthusiasms were noted to become tempered with a realization of certain deficiencies in training, and the consideration of the future is approached with hesitancy and diffidence induced by cognizance of lack of training and experience in such conditions as spastic paralysis, poliomyelitis, and other diseases of the young and the old. Most therapists have demonstrated an exceptional anxiety to learn and to be better informed. Many are seeking information regarding refresher courses and postgraduate work but find it difficult to secure the detailed information pertaining to facilities available for professional rehabilitation and further training. It would seem that schools which participated in the accelerated training programs would find it beneficial to their ratings to maintain closer liaison with their graduates for the purpose of encouraging qualifications as high as those required of past and future graduates.

It is apparent that the little publicity given to refresher and postgraduate instruction should be greatly intensified, not only for the purpose of elucidating the several programs available but also as a means of encouraging further study.

The Enlisted Technician

The shortage of qualified therapists remained an acute problem during the entire period of hostilities, necessitating the assistance of untrained and unqualified enlisted men and, during the latter part of the war, a number of enlisted WAC technicians who were given several weeks of didactic and practical training. Experience has demonstrated that with a conscientious endeavor to train enlisted personnel with a few of the fundamentals by class-work, demonstration and increasing experience, it was possible to secure a group which for interest, loyalty and devotion to duty compared favorably with the others. It is granted that the utilization of this type of personnel was a far cry from the expectations of qualified commissioned therapists. The fact remains, however, that these enlisted men and women, aside from their invaluable assistance in the usual janitorial service, such as cleaning, change of linen and the like, were able satisfactorily to manage such procedures as placement of apparatus, operation of whirlpool baths and the application of massage to nonhazardous conditions, such as the backaches and internal derangements of the knee, of which there were large numbers. All ministrations, of course, were under the strict supervision and surveillance of qualified personnel — the physician in charge and the graduate therapists. Personal communication with others utilizing enlisted personnel reveals a concensus overwhelmingly substantiating their indispensability.

If one multiplies these groups of enlisted personnel by the hundreds of military hospitals, from the large general to the small station hospitals, one begins to appreciate the large numbers of unqualified men and women who conceivably might claim some special knowledge in physical medicine with particular emphasis on special training in the service. There is reason to expect that an era of unqualified practitioners will present itself, involving as great a problem as that reported after the First World War. I have personal knowledge of several events which cast flickering shadows of coming events. One man in my group had established a "massage emporium" in association with a friend who was a practical nurse, the fact being discovered by his stupid employment of a patient to print his name cards in the occupational therapy section. Needless to say, that business ceased forthwith. It is gratifying to note that time and effort discussing the advisability of securing proper training was rewarded by this man's decision on separation to complete his college training with a view to securing the requisite qualifications for entrance to an accredited school of physical therapy. In another instance one of the WAC technicians showed me a communication from an orthopedic surgeon who offered employment in his office as a physical therapy technician. I have further personal knowledge of another enlisted man, who, entranced with the possibilities of physical reconditioning, plans an establishment furnished with apparatus for heat, massage, and exercise after the fashion of the well advertised health centers.

It seems that medicine is already overburdened with cults, irregular practitioners and others entering through the back door of practice. Now that physical medicine has secured a firm foothold for its establishment as a special field of medicine, it would seem disadvantageous to be held responsible for any added burden. The problem is presented with the belief that it merits concerted attention and action.

Occupational Therapy

The progress of occupational therapy in the service has been just as phenomenal as that of physical therapy. In spite of a belated start with an even greater shortage of qualified personnel, the interest and participation of patients presented a continuing challenge for the expansion of facilities. The initiative and resourcefulness of occupational therapists in utilizing any kind of work space and all types of salvage materials for successful operation is a credit to the group and to their schools. The problems incidental to an accelerated training program for occupational therapists are of no less import than those for physical therapists. The forcible impress of occupational therapy as an adjunct in rehabilitation in military hospitals leaves one little need to believe that this activity will suffer disregard, as was the case following the First World War.

Convalescence

The continuation and intensification of convalescent reconditioning and rehabilitation in the veterans' hospitals and the increasing interest in community rehabilitation centers attest the efficacy of planned convalescence. The changed concept of rest and the intensive activity programs as developed in the service have demonstrated the need for broader use of the many measures of planned convalescence, comprising the facilities of physical therapy, occupational therapy, physical reconditioning, educational reconditioning, recreation, psychologic rehabilitation, social adjustment and job training and placement. The message and gospel of reconditioning will undoubtedly carry over into civilian practice, perhaps not with the intensity of effort in the service but assuredly with the cognizance of better follow-up beyond the state of definitive medical and surgical care.

Let us not be deceived. The civilian hospital would do well to emulate the programs of convalescence and reconditioning of the military hospital. However, the tremendous expenditure of funds necessary to equip and staff activities for physical therapy, occupational therapy, gymnasium, swimming pools, public address systems, theaters, libraries and social work, makes this possibility very remote indeed. It would seem that a recognition of the possibilities of reconditioning, together with concentration on individual problems, might be the initial point of departure for the elaborate program of the future.

The Future

For as long as I can remember, I have noted such statements as "the future (of physical medicine) looks bright," "the infant has grown up," "the long-delayed development seems to be at hand." It seems appropriate to state that the future is here. A discussion of the future implies the necessity for watchful waiting; perhaps this was the apathy of which the medical profession has been accused. On the contrary, physical medicine, having contributed gloriously to the medical care of the sick and wounded, has now attained the confidence of the profession and an enviable degree of prestige.

Let us rationalize. Consider the thousands upon thousands of physicians, nurses, technicians, and nonprofessional personnel directly concerned with reconditioning and rehabilitation in the armed forces. Consider the several thousand hospital installations each staffed and equipped with all or many of the facilities in physical medicine. Consider the thousands upon thousands of civilian employees who, although indirectly concerned with the work, have gained a knowledge of benefits derived. Now consider the several million sick and wounded who have participated in the reconditioning

programs. Unless efforts at maintaining the peace falter, it is doubtful that ever again there will be as great an upsurge of interest and activity in physical medicine as has been experienced during the war.

It appears, then, that the standards of physical medicine in the service have now been established for a more thorough utilization in civilian life. The clamor of a younger generation familiar with the benefits of physical medicine, in conjunction with vast numbers of physicians oriented in the principles of planned convalescence, assures the expansion of existing facilities and the provision of additional ones. It is hoped that the developments attained, properly evaluated by careful analysis, research and investigation, will maintain the finally acquired prestige and confidence of the medical profession.

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Discussion

Dr. Walter Solomon (Cleveland): During the past few months numerous articles have appeared in the different national journals extolling the achievements of the medical and surgical services of the armed forces. Certainly praise for these services cannot be overdone. Up to the present time too little has been heard and written about the specific contributions of Physical Medicine. The record of physical medicine in this World War is a glorious one and is no less enviable than that of the other two major services. It is an old worn story to recall the indifference and neglect and abuse physical medicine has had to endure in the past. Unfortunately this attitude was still present during the early months of this war. I can speak from personal experience. However, the situation soon changed. This was obvious. Would anyone have foreseen that approximately fifty per cent of the patients admitted to an army hospital would receive physical treatments of some type or other, as Dr. Rudolph has shown? My experience with the Fourth General Hospital overseas during thirty-nine months of operation showed that there were more than 110,000 visits of patients to the Physical Therapy Department. These patients received more than 300,000 treatments. These are prodigious figures, but at that they are dwarfed by the volume of work performed by other army hospitals which functioned in this country.

The analysis of the table of Dr. Rudolph showing the many diseases and disorders that were treated at his hospital is significant in the fact that although the greater percentage represented traumatic conditions which were the result of war injuries, a large number of cases were from medicine, dermatology, oto-laryngology, dentistry and the other services. Again I can cite an observation from the Fourth General Hospital. While the hospital was in Melbourne, Australia, a survey showed that approximately forty per cent of the patients were from the medical services. This changed later when the hospital moved to New Guinea and received a larger share of the battle casualties but the earlier figures demonstrated that a department of physical medicine is not con-

fined to the treatment of orthopedic or traumatic surgical disorders; an idea that has been prevalent for too long a time.

It is probably well to re-emphasize the comments made by the speaker of the dangers of an increase in the number of irregular and unqualified practitioners. Many non-commissioned persons were trained in the army and navy in departments of physical medicine and who therefore assume they are equipped to treat various disorders and diseases. Sir Morton Smart in the May (1946) issue of the *ARCHIVES OF PHYSICAL MEDICINE* relates the difficulty experienced in England after the first World War when the ranks of these so-called therapists were "greatly swelled." I believe the following words of Dr. Earl Elkins are wise and appropriate when he says "there should be no misunderstanding relative to the fact that a person who is trained in physical education *only*, is a layman and should not be considered as a trained technical assistant except in rather limited circumstances in the overall field of physical reconditioning." The fears of these men are not without foundation. The use of physical agents by many types of non-professional persons in the past and present should serve as warning.

After hearing this fine presentation we can feel justly proud of what has been done for physical medicine. Real progress has been made and recognition has finally and definitely been established. However, much remains to be achieved and there is yet much to be desired. I believe the future offers still greater opportunities.

Dr. C. O. Molander (Chicago): I have listened to the paper of Dr. Rudolph, describing the use of physical medicine in the Army, with a great deal of interest. He speaks of its broad use and spectacular results and hopes that the reconditioning and rehabilitation programs might be carried over into civilian hospitals.

Dr. Rudolph describes the work in his particular Army hospital and states that fifty per cent of the cases were referred to physical medicine. He gives a résumé of the type of cases treated, relation to the staff and then tells of the personnel problems, the heroic work carried by the

physical medicine personnel; but is distressed by the personnel shortage which they hope may be overcome by accelerated training programs, refresher and postgraduate courses. One of the big points he stresses is that the military program, as conducted in the Army, should be carried

over into civilian practice. This is an extremely important point, for following the last World War, physical medicine slumped badly, and if it occurs again, it will suffer severely and may have great difficulty coming to the front again.

THE THERAPEUTIC EFFECT OF THE CLIMATE OF ARIZONA

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The benefits to be obtained for patients by a change in climate have been known for hundreds of years. It was commonplace for Galen to send his tuberculous clients to Tabia, a mountain resort near Vesuvius, and no less ordinary for Celsus to recommend a long sea voyage to his patients. But, although climate has been a favorite mode of therapy for countless physicians, it is surprising that so little is known of the specific advantages to be derived from its use. The decision in favor of a change of climate for reasons of health is not to be made lightly; but, unfortunately, the seriousness of the project is rarely matched by an equal accuracy of information on which to base the choice. It cannot be pretended that the subject of climatotherapy has been reduced to a science; but some reasonable and adequately reliable indications have now been established in this field, and they should be familiar to all physicians. Certainly, it is no longer necessary for decisions to be governed, as they now are, largely by the desperation of the patient, the ignorance of his physician and the cupidity of the travel agent.

In considering this problem, the physician must have knowledge of four factors which will be of different importance in each case but which should be considered in every one. He must know something of the climate to which it is proposed to send the patient; he must know whether the particular disease from which the patient suffers is likely to improve in this climate; he must know the duration and development of the disease in the patient, and, lastly, he must have intimate knowledge of the personal circumstances of the patient and his family with regard to wealth, means of livelihood and domestic care.

The Climate of Arizona

When one examines the Arizona climate, certain outstanding traits are found; although each of these is to some extent accentuated in other places, they are in no other climate gathered together so abundantly. It has been said that the ideal climate is that which enables people to be out of doors as much as possible with as little clothing as possible; in its approach to this ideal it is doubtful that Arizona can be surpassed.

For purposes of climatic description it is necessary to divide the state roughly into a southern third and a northern two-thirds. The southern third is comparatively low, and few places in it are higher than 2,500 feet above

sea level, most being considerably below this and some — such as Yuma, in the southwest — are almost at sea level. In this southern area are found abundant sunshine, great warmth, meager precipitation and low humidity, together with comparatively stable barometric pressure and slight storminess. Perhaps even more important than the individual features of the climate is the relative constancy of the elements composing it. If in the North and East there appears to be no climate but only weather, in Arizona it seems as if weather has been reduced to comparatively superficial changes in a basically stable climate. The atmospheric *milieu extérieur* changes but little. Seasonal changes are noticeable but never disturbing except to the sensitive. In this may lie not a little of the therapeutic effect, for, as Hippocrates observed many years ago, "it is changes that are chiefly responsible for diseases, especially the greatest change, the violent alterations both in season and in other things. But seasons that come on gradually are the safest, as are gradual changes of regimen and temperature."

The sunshine is strikingly profuse. It has been shown that in Phoenix the sun shines 85 per cent of the time it is above the horizon. Denver has 69 per cent of possible sunshine, Chicago 57 per cent, New York 56 per cent and Philadelphia only 49 per cent. The rivals of Arizona in warmth cannot equal it in sunshine, as New Orleans has only 59 per cent possible sunshine, Miami 66 per cent and Los Angeles 72 per cent.¹ In winter, the figures are even more unfavorable to the eastern cities. If a patient in an eastern city can lead a sufficiently relaxed and leisurely life, he may well, in the summer at least, enjoy enough of the sun to provide for his needs in the little time during which it is available. More often than not, however, he is working or for some other reason cannot get out at the time the sun is shining and so the opportunity is missed. But in Arizona to miss the sun one day is merely to delay its enjoyment until the next. Indeed, there are probably not more than four or five days in a whole year when the sun does not shine at all. The abundant sunshine of Arizona has, of course, made the climate renowned for the treatment of conditions requiring intensive heliotherapy, such as bone and visceral tuberculosis. There is a tendency perhaps to neglect the no less important psychologic effects of prolonged sunshine which is extraordinarily invigorating. No one with any experience in these matters will deny that the action of sunshine goes far beyond the tanning of the skin and the production of vitamin D. These subtle effects may never be analyzed in the laboratory, but they are, nevertheless, present and significant. Sir Henry Gauvain² has taken some pains to establish this point in greater scientific security, and his comparison of the mental performances of school children living in and out of doors is ample confirmation of the impression which so many physicians have firmly held.

The second outstanding feature of the climate is the constant genial warmth. On the whole, the temperature is higher than that of any other habitable part of the United States.³ In the winter the days are delightfully warm, with average temperature of 60 to 80 F., whereas in the summer the daytime temperatures reach the higher figures of 80 to 110 F. Thus, a person may enjoy the warmth of an eastern summer in the middle of an Arizona winter. The heat, however, is largely derived from direct radiation of the sun. This is due to the fact the ground and scant foliage hold little heat-retaining moisture and, consequently, when they themselves are not being heated by the sun, they are cooled rapidly and reserves of heat for warming the atmosphere are slight. It is noticeable that the shaded sides of streets

1. United States Weather Bureau reports.

2. Gauvain, H.: The Effect of Sun, Sea and Open-Air in Health and Disease, *Practitioner* 118: 137, 1927.

3. Higher temperatures are recorded in parts of California, notably in Death Valley.

are much cooler than the sunny sides; similarly, when the sun goes behind a cloud (which does occasionally occur in Arizona) the air may suddenly feel cool. A more striking effect of this low humidity is the lability of the daily temperature, for at night the heat is quickly dissipated and the mercury may drop rapidly. In the summer this cooling effect provides a pleasant relief from the often excessive warmth of the day and the extent of the change is not great. In the winter, however, the fluctuations are even more marked; indeed, a daytime temperature of 80 F. may be succeeded in a few hours by one of 35 to 45 F. A certain amount of adaptation to these daily swings of temperature seems to occur, but for the unwary serious chilling can be unpleasant. These drawbacks are perhaps not of great therapeutic significance but are distinctive features of the climate which may be of importance to the person seeking to benefit from it; they will not, however, deprive him of the general effect which is achieved by the perennial warmth.

To residents of other states, the summer daytime temperatures mentioned may evoke images of severe heat. This might well prevail were not the precipitation and humidity of this region so low. At Yuma the mean yearly rainfall is 3.2 inches; at Phoenix it is 7.5 inches, and at Tucson it is 12 inches. In New York the mean annual rainfall is 42 inches and in New Orleans it is 58.5 inches annually.¹ The barometric pressure in this area is unusually stable, and storms are few; the great cyclonic disturbances which sweep over the eastern and northern parts of the country are foreign to Arizona, as a glance at charts of storm paths will show.⁴ In addition, the humidity is low as the figures of mean relative humidity in table 1 indicate.¹

TABLE 1. — *Mean Relative Humidity*

Time	New Orleans	New York	Phoenix
7:30 a.m.	84	72	57
Noon	62	58	30
7:30 p.m.	71	66	28

The low humidity enables the cooling of the body by evaporation to be handled efficiently and comfortably. Sweating, in fact, is actually much less noticeable in Arizona, with its higher temperatures, than in Louisiana, where in summer the atmosphere is humid.

The rain in southern Arizona occurs principally during the summer and winter, with little in the spring and autumn. There is so little rain that during the "rainy season," which is the term applied to the period of maximum rainfall between July 1 and September 30, the thirst of ground and air is barely slaked. To meet the need for continual water, huge dams have been built in the Salt River Valley, and vast irrigation projects have transformed the desert around Phoenix into one of the richest agricultural areas of the world. It is alleged that these water developments have increased the humidity around Phoenix and have in effect reduced it to a jungle swamp. This, in fact, is not true; the records of the United States Weather Bureau Station show that the humidity at Phoenix has made a change which is barely perceptible and certainly not significant. It is important to remember, however, that even in the southern third of Arizona relevant climatic differences may exist between different points. Thus, Tucson is higher (2,565 feet above sea level) than Phoenix (1,117 feet above sea level) and, not unexpectedly, it is windier and cooler; this last fact is usually counted an advantage in summer and a disadvantage in winter, but the point of view will depend upon the patient concerned.

In the northern two-thirds of the state the climate is distinguishably different from that which has just been discussed. Here the altitudes are

^{4.} (a) Mills, C. A.: *Medical Climatology*, Springfield, Ill., Charles C. Thomas, Publisher, 1939; American Health Resorts Series: *Climate and Disease*, J. A. M. A. 123:551, 1943.

much higher, ranging from about 5,000 to 7,300 feet, with some peaks much higher. The temperature of this region is much lower and the storm incidence higher; precipitation is more abundant and in winter snow arrives in liberal allowances; seasonal changes are much more prominent than in the south. The sunshine is almost as profuse as in the southern area and, owing to the clarity of the air at higher altitudes, is perhaps more beneficial and higher in content of ultraviolet rays. In the Eastern industrial areas the discrepancy in actinic ray action between the smoke-hung lowlands and the clear highlands may be not only extreme but very important. This distinction is less important in Arizona, where the air is almost universally clear and little darkened by fogs or polluted by factory smoke. However, the other differences of climate in the two principal areas of Arizona are of considerable importance in the selection of a suitable home for the individual patient; this is rarely true of the trivial deviations of places in the same general area.

Diseases Usually Benefited by This Climate

The patients who come to Arizona for the relief of their symptoms exhibit an extraordinary diversity of diseases, and it is to be hoped that the enthusiasm of the patients rather than the deficiencies of their physicians is responsible for the presence of the numerous persons who are unlikely to be benefited by the change of climate. Yet it is not uncommon for patients with peptic ulcer or congestive heart failure to say that their doctors told them Arizona offered the ideal treatment of their ailments. There can be little excuse for this misinformation. The conditions for which patients should seek relief in Arizona may be roughly divided into four groups: (a) diseases in which heliotherapy is indicated, such as bone and visceral tuberculosis and lupus vulgaris; (b) respiratory diseases, such as tuberculosis, bronchial asthma, chronic bronchitis, bronchiectasis and sinusitis; (c) rheumatic and arthritic diseases, such as rheumatic fever, rheumatoid arthritis and fibrositis; (d) diseases which are exacerbated by infections of the upper respiratory tract and the climatic stimulation of stormier areas, such as cardiac disease and nephritis.

Osler was by no means the first to dwell upon the important benefits to be obtained from climate in tuberculosis, but the prominence which he gave it in his teachings⁵ did much to develop the enlightened use of this therapy. As constituents of the ideal climate for tuberculosis he prescribed pure air, maximum sunshine and equable temperature, three climatic conditions found more consistently in Arizona than perhaps anywhere else. It is not surprising, therefore, that, on the whole, patients with tuberculosis derive great benefit from their trips to that state. Sunshine has been known to be of great value in bone tuberculosis ever since the tremendous work of Rollier in Switzerland; in lupus vulgaris it is considered specific. Although Rollier wrote that it was of benefit in pulmonary tuberculosis also, physicians have been hesitant to apply it in cases of this disease. Their fear has probably arisen from increases in fevers noted in many patients after exposure to sunshine. Flinn,⁶ who at the time of his death probably had more extensive experience with this therapy than any one else in this country, felt that sunshine in suitable doses was of distinct benefit in pulmonary as well as bone and visceral tuberculosis. He prescribed it cautiously, as if it were a mild form of exercise, and was never disappointed and usually gratified by the results. Indiscriminate treatment of the chest he naturally

5. Osler, Sir William: *Principles and Practice of Medicine*, ed. 8, New York, D. Appleton & Company, 1924, p. 226.

6. Flinn, J. W.: *Influence of Climate as Distinguished from Fresh Air in Treatment of Pulmonary Tuberculosis and Its Complications*, *Am. Rev. Tuberc.* 4:300, 1920.

deprecated and advised gradually increasing exposure of the body with the development of tolerance to the sun's rays. His favorable opinion of this therapy has been shared by other authorities.⁷

On the question of the effect of temperature on tuberculosis there is some doubt. It was the opinion of Trudeau that hot weather is detrimental to tuberculous subjects: "The hot weather is, I think, unfavorable to phthisical patients and the greatest improvement takes place from early fall to early spring."⁸ This impression was confirmed statistically in his sanatorium and by other observers.⁹ The fact is probably related to the stimulating effect which cold weather has on the body and the comparatively enervating influence of warmth. It may well be, therefore, that tuberculous patients would do better in the northern two-thirds of the state than in the much warmer southern third. However, in that case, the Arizona climate is nowhere absolutely ideal, since storminess and rainfall are great in the north and bring attendant acute respiratory infections; in these northern areas, furthermore, the beneficial dryness of the air is not nearly so pronounced as in the south. This dryness probably acts in different ways. Bacteria are certainly more sensitive to the action of sunshine in dry air. In addition, the dryness probably affects the bronchial secretions and apparently tends actually to dry them. Such is, in any event, the effect noticed by the patient, who frequently is the first to comment on the diminution in his cough and expectoration. It is naturally impossible to say just how much this depends upon actual drying and how much upon concomitant improvement due to other factors. The role of altitude in pulmonary tuberculosis is probably not specific. It is almost certainly secondary to increased content of ultraviolet rays in the sunshine and to increased coolness. In some cases of advanced tuberculosis or emphysema the benefits of altitude may be offset by the diminished oxygen tension at the higher levels. Indeed, in some cases high altitudes are dangerous and can be fatal. On the whole, there can be no doubt that the climate of Arizona is everywhere beneficial to patients with tuberculosis, and the principal point to be observed in selecting a site for the patient is whether or not the benefits of moderate cold are to be sacrificed for those of dryness and lessened storminess.

In connection with tuberculosis, it must be remembered that the death rate from tuberculosis is higher in Arizona than in any other state of the Union. The figures in table 2 show how far Arizona is behind the general trend toward lower mortality from tuberculosis.⁹ These statistics, however, invite a comparison which is unfair to Arizona. In the first place, patients with serious tuberculosis have been largely concentrated there from every other state of the country. In a sense, the state has become the sanatorium of the nation. Unfortunately, it is not yet fitted for this role, and herein lies another explanation of the high mortality rate. The state is yet very young; in a land where there is still much talk about pioneering and frontiers it is unfair to expect political maturity. Public health programs and endowments are but slightly developed; there is little control over the patient with open tuberculosis, and, even if there were some form of legal supervision, the facilities in the state are inadequate to cope with the patients needing care. At present the immigration of patients far exceeds the expansion of provision for their treatment. There is in Arizona a great awareness of this problem among responsible people, and there are indications that something will be done about it soon. In the meantime, there is an

7. (a) Laird, A. T.: Heliotherapy in Pulmonary Tuberculosis, *Am. Rev. Tuberc.* 18:80, 1928. (b) Tuberculosis, *ibid.* 18:523, 1928.

8. Trudeau, E. L.: Quoted by Flinn.⁶

9. Mortality Statistics, Department of Commerce, Bureau of the Census, 1900, 1910, 1920, 1930, 1940, 1944.

added obligation on the tuberculous patient and an increased need for caution on the part of the nontuberculous one.

If the climate of Arizona is suitable for patients with tuberculosis, it seems no less beneficial to those with bronchial asthma. Unfortunately,

TABLE 2. — *Mortality Rate for Tuberculosis of the Respiratory Tract per 100,000 Population**

Year *	Arizona	United States
1900	-----	174.5
1910	-----	133.3
1920	-----	99.8
1926	328.5	74.9
1930	311.9	63.0
1940	162.8	42.1
1942	114.9	39.6
1944	113.7	38.3

* Arizona was admitted to the Registration Area in 1926. The figures for Arizona for 1942 and 1944 are based on deaths among residents of Arizona, whereas the earlier figures were derived from deaths which occurred in Arizona, irrespective of the state of origin of the deceased. Therefore the death rate from tuberculosis in Arizona is actually greater than that represented in these figures for these years, and the death rate for residents of Arizona was less than actually represented by the figures for the years before 1942.

fewer detailed studies of asthmatic patients have been published, probably because the condition lends itself less nicely to statistical analyses of progress. Asthma is more often paroxysmal than continuous, and patients rarely keep accounts of the number and severity of their attacks, having little except subjective impressions with which to measure their progress; tuberculous patients, on the other hand, are usually steadily improving or deteriorating. There is, however, a general impression that the climate of Arizona is favorable in this condition. One encounters patients who are no better or worse after arrival, but for each of these one meets two or three who, after a few months' or years' residence in Arizona, have never been troubled with asthma again. In between lie a great group who, although not obtaining complete relief, think the change was worth while. This impression has been substantiated by Baldwin's study.¹⁰ Of his 62 patients (who were all known to have been in Arizona not less than four years) 44 per cent had been completely relieved of symptoms for two or more years and 34 per cent had been greatly benefited, whereas the remaining 22 per cent must be considered to have shown no improvement. In this series only those patients who were considered nonallergic were assessed, because the climate can be expected to help only those whose asthma is caused, or at least largely influenced, by atmospheric changes and respiratory infections. In these cases Baldwin noted a definite correlation between the improvement observed by the patients and their freedom from respiratory infections in the new climate. It must be remembered, however, that many patients are not benefited by residing in Arizona and that asthma develops in many natives of Arizona while they are living there. Asthmatic patients have often fled the allergens in one state only to run into those in Arizona, a situation which could be prevented if their cases were studied more carefully before the change was made.

Of chronic bronchitis and bronchiectasis it is even more difficult to speak with statistical authority, although the same favorable impression prevails. The elderly patient with bronchitis who is little bothered by the eastern summer but who drags out a miserable winter, racked by cough and dyspnea, is usually greatly relieved by the equable winters of Arizona. Much less can be promised the patient with bronchiectasis. Probably little im-

10. Baldwin, L. B.: Solar Radiation and Climatotherapy of Tuberculosis and Chronic Pulmonary Disease in the Sunny Southwestern Desert, in Mayer, E.: *Radiation and Climatic Therapy of Chronic Pulmonary Diseases*, Baltimore, Williams & Wilkins Company, 1944, chap. 15.

provement can be achieved in bronchiectasis by the climate unaided; however, there is no doubt that for many of these patients the climate of Arizona provides the most favorable background for other more specific measures. Patients with chronic bronchitis and bronchiectasis are continually haunted by the threat of recurrent acute respiratory infections, each one of which, if not actively contributing to his further deterioration, certainly retards his progress. This menace can be largely removed or allayed in Arizona. I have met enough patients with bronchiectasis who were satisfied with their removal to Arizona to convince myself of this point. These patients were not cured, but they were improved to the point that they were not only comfortable but leading useful lives, whereas in the North or East life had been hardly tolerable. In these conditions, however, dogmatism must be avoided. Many bronchitic subjects are more comfortable in the warm, moist atmosphere of a Southern sea coast and are unhappy in the dry, sometimes dusty climate of the Southwestern desert;¹¹ others, with sensitive bronchial tubes, may suffer from the abrupt changes and cold night air of the Arizona winter. Such patients may do better where the air is damper but the temperature less fickle, and for them Florida, California or Louisiana should be considered.

Many observers of climatotherapy in Arizona are convinced that the greatest benefits are obtained by rheumatic and arthritic subjects rather than patients with pulmonary disease. This argument is open to dispute, but there can be no doubt that rheumatic and arthritic conditions are greatly aided by the Arizona climate. After fourteen years of observation with special attention to rheumatic diseases Hill and Holbrook¹² had not seen a single case of recurrence of rheumatic fever in patients who had come to Tucson from other parts of the country. Indeed, in their experience (over the same number of years), they saw only 4 or 5 cases of rheumatic fever among the natives of Arizona. I found only 4 cases (all mild) of rheumatic fever occurring among over 1,000 medical admissions in one of the larger general hospitals of southern Arizona. The incidence is greater in the northern, mountainous areas of the state. In the opinion of Hill and Holbrook, the beneficial effect of the climate is not attributable solely to the reduction in upper respiratory infections, although this is important; they found that even when these infections occurred in their patients, they were not followed by the exacerbations of rheumatic fever which had attended such episodes in the North and East. Similarly, patients with arthritis are greatly benefited in Arizona. A patient with rheumatoid arthritis is particularly sensitive to storminess and dampness, and the relative absence of these two factors alone, apart from the benefits of warmth and sunshine which are obtained in Arizona, would account for much of the improvement. It may be that in this respect Arizona has no particular superiority over other climates of almost similar warmth and perhaps greater evenness of temperature, such as California and Florida. However, if it is no better than these, it is in every degree as good.

In Arizona the absence of storminess and the comparatively benign and equable temperature combine to produce a general effect of climatic sedation. The patient is freed from the efforts of resisting and reacting to the buffeting of the Eastern winter. Patients with many diseases, and especially the elderly ones, are thus benefited by being transferred to a gentler environment. In addition, there is the associated and more specific effect of the decreased incidence of acute respiratory infections; this seems to be one of the common factors in the improvement of patients suffering from various diseases, in-

^{11.} Flinn, R. S.: *Medical Climatology*, in Blumer, G.: *The Therapeutics of Internal Disease*, New York, D. Appleton-Century Company, Inc., 1940, vol. 1, chap. 2.

^{12.} Hill, D. F., and Holbrook, W. P.: *The Role of Climate in the Treatment of Rheumatic Disease*, *Clinics* 1:577, 1942.

cluding some not usually considered in the province of climatotherapy. In a patient with cardiac disease a slight cold may mean the difference between subjective well-being and congestive failure. Patients with cardiac disease and nephritis will never be cured in Arizona by the climate alone, but in many cases their lives may be prolonged there.

Respiratory infections are, of course, seen in Arizona, but they are relatively mild. Pneumonia is encountered frequently enough, but it is more apt to be of the bronchial or atypical type than of the fulminating lobar form seen in the Eastern wards. In the same observations of over 1,000 medical admissions mentioned previously I saw only 3 instances of classic lobar pneumonia, although there were ample numbers of patients with bronchopneumonia and virus pneumonia. It is conceivable that respiratory infections would be even fewer if there were no daily swings in temperature, particularly in winter. In summer, drafts from the almost universal cooling systems must account for many acute infections.

It is the impression of some observers,¹³ of whom I am one, that, although these infections are fewer and milder, they are also met with less dramatic reaction than in the North and thus tend to be more persistent and to linger against what appears to be less actual resistance from the patient. This is due to the fact warm climates actually exert a sedative effect, an observation which is at least as old as Hippocrates, who said: "Of daily constitutions [of the weather] such as are northerly brace the body, giving it tone and agility. Southerly constitutions relax and moisten the body, . . . make the eyes and the whole body slow to move." Basal metabolism and tissue combustion are lower when the external temperature is higher, and it has been shown both in animal experiments and by clinical observation that when tissue combustion is less resistance to infection declines.¹⁴ The salutary effect of the Arizona climate, therefore, depends not so much upon increasing the resistance of the patient as upon decreasing the environmental assaults upon that resistance.

Consideration of the Individual Patient

Although it is necessary to know the commoner ailments likely to be benefited by the climate of Arizona, it is even more important for the physician to know the individual circumstances of the patient. The art of climatotherapy consists in applying the general rules to the individual patient.¹⁵

On the whole, those patients will benefit most whose diseases have been most dependent upon climatic violence and associated respiratory infections. Some patients, of course, such as those with bone tuberculosis, will be benefited by the sunshine, even if they have not been particularly bothered by inclement weather at home. Many elderly patients who had accustomed themselves to hibernation in the North and East have led a full life in the Arizona winter. Naturally, patients who are in the earlier stages of their affliction will benefit more from the change of climate than will those with advanced anatomic changes; it is the responsibility of the physician to recommend the change to those whom it will benefit in the early stages of their diseases. Too often the recommendation to change climates come as a sign of resignation from the baffled physician.

If a patient elects to try the climate of Arizona, he should do so with an understanding not only of what he may expect from the climate but also of what he himself must contribute to the attainment of health. He should

13. Flinn, R. S.: Personal communication to the author.

14. Mills, C. A.: *Climatic and Weather Effects with Special Reference to Respiratory Diseases* in Mayer, E.: *Radiation and Climatic Therapy of Chronic Pulmonary Diseases*, Baltimore, Williams & Wilkins Company, 1944, chap. 12, Footnote 4.

15. Singer, C. I.: *Application of Climatotherapy in General Medicine*, Arch. Phys. Therapy 22:595, 1941. Miller, 7b

be willing to stay some time in Arizona for the expected benefits and should not expect dramatic changes in a brief interval. The best results are usually obtained by those who move permanently to Arizona; in the opinion of some¹⁵ the summers are even more beneficial therapeutically than are the winters.

The patient must also exert himself to obtain the maximum effect from the climate while in Arizona. One who goes there expecting to assume an entirely passive role in a natural miracle may expect and will obtain little relief. It is not enough to enjoy the climate as an incidental pleasure of daily life. To travel several thousand miles from the cold fogs of the East and then spend the entire day cramped in an office which is artificially cooled, humidified and illuminated is valueless. On the other hand, treatment should not be ill directed and aggressive, because there are dangers as well as benefits to be encountered in the Arizona sun. I am in complete agreement with R. S. Flinn¹⁶ that climate must be prescribed in carefully regulated dosage and its employment supervised closely. In this connection, it is the duty of each patient's physician to refer him for care and supervision to a physician in Arizona and supply either the patient or the physician to whom he is referred with a letter outlining the previous history and therapy of the case.

The patient must realize that climate is always subsidiary to the other means which he brings to bear on his problem.¹⁷ He should not, for example, make economic sacrifices to go to Arizona if he will be unable while there to afford the care he obtained at home. Nor should he plan to maintain himself by "light work" if he has not previously been able to work at all, since it is unlikely that his improvement in Arizona will be rapid enough to permit this for at least some months. Moreover, the state already has many semi-invalids seeking light or sedentary work. Still less should the patient, if invalidated, sacrifice good home care for the intangible benefits of climatotherapy. In short, the transfer should be made if only the economic, domestic and medical conditions will be as favorable to the patient in his new home as they were in his old one.

In view of the foregoing statements, it is particularly tragic that climatotherapy is often least available to those who can most benefit from it. The rich may afford to go there in the early stages of their disease, but the poor will not turn to this until all other therapies have nearly exhausted their resources. Extensive provision is made for the free distribution of diphtheria antitoxin and insulin to the poor; climatotherapy should be regarded as no less significant in some cases than organotherapy in others, and it should be distributed with equal generosity. A plea for this development has already been made by Mills,¹⁸ but little progress has been made. The diseases amenable to climatotherapy are not particularly dramatic or obscure; they do not strike from nowhere and leave a withered arm: Yet they affect enormous numbers of the populace and are, perhaps, as a whole responsible for more ill health than any other group of diseases. Much benefit could be achieved for patients with these diseases if some of the extensive funds made available for the sensational but relatively rare cases of poliomyelitis were diverted to the provision of climatotherapy for the needy.

15. Flinn, R. S.: *Climatotherapy and Light and Air Therapy*, in Blumer, G.: *The Practitioner's Library of Medicine and Surgery*, New York, D. Appleton-Century Company, Inc., 1935, vol. 8, chap. 6.

16. Flinn.⁶ Flinn.¹⁶ Miller.^{7b}

ARCHIVES of PHYSICAL MEDICINE

OFFICIAL PUBLICATION AMERICAN CONGRESS OF PHYSICAL MEDICINE

∴ EDITORIALS ∴

ANNUAL MEETING OF THE AMERICAN CONGRESS OF PHYSICAL MEDICINE, 1947

The twenty-fifth annual session of the American Congress of Physical Medicine was held September 2 to 6, at the Radisson Hotel in Minneapolis, Minnesota.

The twenty-fifth anniversary meeting was marked by actual recognition of physical medicine as a specialty, since the meeting was immediately preceded by the establishment of a specialty board, and examinations were held for the first candidates to become diplomates of the American Board of Physical Medicine.

There were some changes in the arrangement of the program of the scientific session from that of previous years, in that on three mornings two general scientific sessions were conducted at the same time. In one, the papers given were general subjects in physical medicine; in the other, the papers were primarily concerned with basic research. The topics of general interest dealt with reorganization of the Veterans Administration, manipulative procedures and other subjects in relation to the clinical field. The speakers who discussed manipulative procedures were Dr. Frederic Jostes, of St. Louis, and Dr. James Mennell, of London.

An excellent symposium on poliomyelitis was held. It included studies on the pathologic physiology of bulbar poliomyelitis carried out by members of the medical faculty of the University of Minnesota. Noteworthy papers were presented on electromyographic studies on poliomyelitis and other conditions.

The sessions on research in physical medicine were extremely interesting and were well attended. Such papers as "Regulation of Blood Flow in the Human Muscle," by Dr. Karl Harpuder; "Conduction Velocity of the Skeletal-Motor Nerve Fibers Supplying Paretic Muscles," by Dr. Robert Hodes, and "Electromyography in Kinesiologic Evaluation," by Dr. Leonard J. Yamshon were presented. Another paper of considerable interest to all interested in physical medicine was a study by Dr. William Paul, "Studies on Biologic Responses to Thermogenic Agents." This topic is still the source of controversy, a fact which indicates that these agents are not standardized, even though they have been used for years.

Dr. Rehman and his co-workers presented a paper entitled, "An Analysis of Some of the Forces Exerted in the Human Gait." This study has been in progress for some time under the auspices of the Baruch Committee on Physical Medicine. Knowledge of human locomotion in health and disease, and basic knowledge of functional anatomy, are essential to the practice of physical medicine. However, comparatively little experimental work has been done by medical men in this field and, as indicated in Dr. Rehman's work, many years of study will be required before a thorough knowledge of these subjects can be obtained. Such basic studies as that of Dr. Rehman and his associates are essential to the proper use of therapeutic exercise.

Dr. Frederic Jung, assistant secretary of the Council on Physical Medi-

cine of the American Medical Association, discussed "Physical Physiology as a Basis for Physical Medicine." Other important subjects were "Some Enzyme Activities of Denervated Muscles," presented by Dr. Ernst Fischer, "The Measurement of Surface Temperatures," by Dr. G. K. Stillwell, and "The Effects of Diathermy on Blood Flow; Plethysmographic Studies," by Dr. C. S. Wise.

Several papers on microwaves were presented. There is considerable interest in this new method of heating, but it is obvious from the papers presented that more studies need to be made concerning this new agent. Use of this form of energy should be carefully standardized clinically before it can be made a common therapeutic agent and before it can displace the use of other high-frequency currents.

Dr. H. Worley Kendall, newly elected president of the Congress, gave a challenging address which appears in this issue of the ARCHIVES OF PHYSICAL MEDICINE. This address should be carefully studied by the physiatrist. Dr. Paul B. Magnuson gave the address at the opening session of the Congress, in which he stressed the important role played by physical medicine in the rehabilitation program in Veterans Hospitals. He also stressed the use of physical agents in the treatment of orthopedic patients.

Dr. A. C. Ivy, distinguished professor of physiology and vice-president in charge of the Chicago Professional Colleges of the University of Illinois, gave the address at the annual banquet. He discussed the importance of and the problems in research. The material he presented was challenging and provocative of thought. Dr. Ivy also was asked to discuss his experiences while he was acting as a special medical consultant at the Nuremberg trials in Germany. His remarks relative to the part played by the German physicians in the alleged war crimes in Germany was a strong appeal against the state control of physicians.

The annual business meetings were ably conducted by the retiring president, Dr. Walter McClellan. Evidence of recent advances in physical medicine and of increased activities in the field was much more noticeable at the business meetings than ever before. This was shown by the reports of committees; each committee obviously had carried out much work, as manifested by reports indicating considerable progress in various aspects, such as the fostering of research, the investigation of problems in education, co-operation with projects of the Navy and the United States Public Health Service and other agencies or institutions.

The instruction courses were well studied. The subjects presented were largely basic. It became obvious, however, that in view of the increased interest in physical medicine and the influx of better-trained young men in the field, the material developed for inclusion in the instruction courses must become more and more advanced and directed primarily to physicians.

The scientific exhibits were well planned. Important subjects were presented. Among the scientific exhibits which created considerable interest were those of Mr. Howard Carter and Dr. Frederic Jung of the Council on Physical Medicine of the American Medical Association on "Atomic Energy," Dr. Hellebrandt's on "Physiologic Basis of Disability Evaluation," Dr. K. G. Hansson's and Dr. E. Weissenberg's on "Traction and Cervical Arthritis," Dr. Milton Schmitt's on "Mechanical Aids in Rehabilitation," and Dr. Frederic Kottke's and Dr. William E. Kubicek's on "Muscle Responses to Various Sinusoidal Frequencies." There was a wide variety of commercial exhibits; a number of new types of apparatus were displayed.

It was gratifying to those who have been interested in physical medicine for a number of years to have visited this meeting. The well-attended ses-

sions, the great interest in research, the expression of opinion concerning the urgent need for more basic knowledge, the standardization of the field, and the large number of interested younger men present who were eager to obtain information all are indicative of the rapid growth and interest in this relatively new specialty.

Undying gratitude must be extended to the relatively small group of men who for many years have believed in and fought for the recognition of the field of physical medicine, which finally has become recognized and established as a specialty. However, many problems in education and training remain to be solved.

Those present would certainly wish to express their thanks again to the persons who organized the program and hence conducted the meeting. An expression of gratitude should go especially to the executive director, Dr. Walter Zeiter, and the executive secretary, Marion Smith.

AN AMERICAN NUMBER OF THE BRITISH JOURNAL OF PHYSICAL MEDICINE

With the beginning of this year an Editorial Committee of the British Association of Physical Medicine has taken lead of the editorial policies of our British sister-publication. In response to the cordial invitation of this Committee the Editors of the ARCHIVES have contributed or secured contributions for a series of articles, to be published in November as an American Number of the British Journal of Physical Medicine. In conjunction with the publication of a British Number of the ARCHIVES last year, this is another practical step in bringing about close exchange of ideas between physiatrists on the two sides of the Atlantic. In addition last year's visit of that splendid ambassador of good-will, Sir Morton Smart's as representative of the British Association to the Annual Meeting of our Congress is being followed this year in a similar capacity by James Mennell, recipient of the Golden Key of the Congress. The President of the British Association of Physical Medicine, Lord Horder this year has also made personal contact with our colleagues in New York when he visited in his capacity of Chairman of the Committee on Nutrition of the United Nations. It is to be hoped that with the return to more normal conditions abroad, American physicians can before long resume their visits to England, where they have received so much cordial welcome and inspiration in the past. Members of both societies can show their appreciation and support of these efforts for continued cooperation by reading in addition to their own journal that of the sister organization, too.

AWARDS OF MERIT BY THE AMERICAN CONGRESS OF PHYSICAL MEDICINE FOR THE YEAR 1947

In recognition of distinguished contributions to the medical science of physical medicine the Gold Key award was made to the following:

LORD THOMAS J. HORDER, distinguished son of Great Britain, physician to His Majesty the King, in recognition of his inspired leadership and untiring interest in physical medicine which has led to the establishment by the Royal Colleges of the diploma in physical medicine and the recognition of physical medicine in the United Kingdom as a special branch of general medical sciences.

ANDREW C. IVY, distinguished son of Illinois, Vice-President of the University of Illinois, in charge of Chicago professional colleges and dis-

tinguished professor of physiology, in recognition for his innumerable contributions to the advances of physical medicine, and especially for his constant inspiration and stimulation to the many researches conducted in the department of physical medicine at Northwestern University which has served to make this department one of the outstanding in the country.

MAJOR GENERAL NORMAN T. KIRK, former Surgeon General of the United States Army, distinguished son of the United States, in recognition of the fact that he, more than any other prominent figure in governmental medical services, stands irrefutably as the one who has been most fully cognizant of the value and importance of physical medicine as a major phase of the healing art.

AWARDS TO SCIENTIFIC EXHIBITORS

The Committee of Awards for Scientific Exhibits presented through its Chairman, Dr. Frank H. Ewerhardt, the following awards:

Gold Medal to Frances A. Hellebrandt, M.D., for her exhibit, Physiologic Basis of Disability Evaluation.

Silver Medal to Milton G. Schmitt, M.D., for his exhibit, Mechanical Aids for Rehabilitation.

Bronze Medal to O. Leonard Huddleston, M.D., for his exhibit, Reconditioning in Chest Diseases.

Honorable Mention to Kristian G. Hansson, M.D., and Eugene Weissenberg, M.D., for their exhibit, Traction in Cervical Arthritis.

PROGRESS REPORTS

A Visit to Warm Springs, Ga.

By Richard Kovács, M.D., New York

One of the most impressive aspects of our American medical scene is the recurrent phenomenon of sheer individual inspiration combined with sustained effort creating unique institutions in places remote from the main arteries of commerce or wealth. Two outstanding examples are the Mayo Clinic, out in the farmlands of Minnesota, and the Warm Springs Foundation, among the rolling hills of Georgia. The Mayo Clinic was created by two country physicians, the Mayo brothers, while at Warm Springs the humanitarian intuition of an outstanding layman, who was himself the victim of a dreaded scourge, was responsible for the institution which, like the Mayo Clinic, has become a beacon light of medical progress and attracts patients and medical men from all over the world.

It is now a matter of historical record how Franklin D. Roosevelt, stricken by infantile paralysis in 1921, came as a convalescent in 1924 to Warm Springs, Ga., to enjoy the advantages of a mild climate, pleasant environment and the warm, natural springs which have been used for

bathing in the form of tiny pools for half a century. Warm Springs was little known to anyone except as a summer resort for those from the nearby hot lowlands or the coastal plain. Bathing and exercising in the warm pools brought renewed vigor to the distinguished visitor, and he resolutely set about to enable other victims of poliomyelitis to enjoy the same advantages and to place Warm Springs under competent medical leadership. As a result of his efforts, experimental work under expert supervision was begun in 1926, when 23 patients were placed under observation for periods of five to seventeen weeks, and all appeared to make some improvement. In 1927 The Georgia Warm Springs Foundation was organized "to develop an institution to render services to those physically handicapped by infantile paralysis." In 1938 the National Foundation for Infantile Paralysis was created chiefly as a result of the public interest aroused by the work at Warm Springs, as well as a tribute to President Roosevelt's deep humanitarian instinct. The two Foundations have worked side by side ever since, the National Foundation attacking the problem through all forms of research, study and education, while Warm Springs serves

for the treatment of children and adults suffering from the after-affects of infantile paralysis, with the object to pass on to the medical profession any useful observation of special methods of proven merit.

My first short visit to Warm Springs took place in 1939, when I observed the reeducational work done in its large warm water pools and the excellent orthopedic work directed by Dr. C. E. Irwin, Chief Surgeon. This spring I came back for a more extended visit at the invitation of Dr. Robert L. Bennett, who has been active as Director of Physical Medicine and Director of the Physical Therapy Post-graduate School since 1942. Friend Bob met me at the railroad station at Atlanta. Warm Springs is situated in Meriwether County, of Central Georgia, about 75 miles southeast of Atlanta. We drove on over excellent roads, passing a modern airport 6 miles south of Atlanta, where many patients for Warm Springs arrive and are met by special limousines of the Warm Springs Foundation. Those coming all the way by train come directly to the Southern Railroad Station at the village of Warm Springs.

The grounds of Warm Springs Foundation are situated about half a mile outside the village. We drove through stately stone gates into a tract of land in a natural state of forestation, with tall oaks and pines, extending over 1,800 acres at an altitude of over 1,000 feet on the slopes of Pine Mountain. The Foundation forms a complete community in itself, with its own water supply and sewage system. New imposing stone buildings of colonial architecture have replaced practically all remnants of the old health resort. Most of them have been built according to a master plan, forming a quadrangle round a landscaped central tract, the "Campus." Georgia Hall forms the entrance to the campus; it contains the reception and information desk, administrative offices, a community dining-room and comfortable lounges and corners for games and music. At the opposite side of the campus is the large Medical Building, a three story structure; its first two floors house the examining room and offices of the medical department, x-ray room, medical library, an operating room suite, etc.; the third floor has accommodations for 40 patients, chiefly bed patients. Adjoining the Medical Building, the Memorial Infirmary serves for patients who still require nursing supervision, while fully ambulatory patients live in two other buildings along the campus, Kress Hall and Builders Hall.

The total bed capacity of Warm Springs is at present 165. Patients are admitted for examination after receipt of a complete medical history by their own physician

and its review by the medical staff. Once they are admitted, no distinction is made in the care or housing of pay, part aid and full aid patients, and no profit is derived from treatment of any patient. In 1946, financial assistance was given to 396 of the 700 patients, or 63.42 per cent of the total of hospital care. No patients are accepted who appear to be receiving adequate care elsewhere or who in the opinion of the staff would not benefit by a change. The average length of stay of patients at the institution is at present about three months.

Walking through the spacious buildings and adjoining cottages, one is impressed by the careful planning to enable the handicapped and wheelchair-bound patients to move about with comparative comfort and safety. All buildings used by patients are provided with ramps; the hallways are fitted with guard rails, and rooms and washrooms are equipped with hand rails and other devices to facilitate going about without the aid of an attendant. One is also impressed by a spirit of good fellowship and cheer shown by these patients, whether they are on crutches, on stretchers, in wheelchairs or in hospital beds; for the patients feel that they are here to make progress and are constantly impressed by the high morale of the entire personnel of the Foundation. Among the most inspiring features in the daily routine at Warm Springs is the sight of many former patients who are engaged in conducting essential activities.

Physical therapy naturally plays a very large role in the good results accomplished at Warm Springs. The leadership of Dr. Bennett has brought about additional advances in the splendid work done from the beginning by a corps of able physical and occupational therapists. The two large "off campus" pools for under water exercises, have been replaced since 1942 by the Campus Pool, situated on the large central quadrangle, very near the Medical Building. This large indoor pool has a water heating and recirculating system which makes possible the raising or lowering of water temperature as may be indicated.

The general physical therapy department is just now being transferred into a Campus Pool Building from the Medical Building. A smaller unit for physical therapy serves for bedside treatment in the Infirmary Building. A modern brace shop has been erected near the new physical therapy unit, and the inventive genius of Dr. Irwin and Dr. Bennett is responsible for the construction of many newer, efficient and light weight types of appliances.

The Physical Therapy Postgraduate School, inaugurated in 1941, forms an outstanding part of the physical therapy ac-

tivities. Its spacious quarters are located in the basement of the Medical Building. The former twelve months course has been replaced by three intensive three month courses, at which a selected group is trained in the care of all phases of poliomyelitis: accurate muscle strength evaluation, body mechanics, muscle reeducation, including underwater exercises, correct use of assistive and supportive apparatus and walking reeducation. Miss Alice Lou Plastridge is Assistant Director of the School, with a staff of five instructors. All students receive monthly pay and full maintenance through a grant from the National Foundation for Infantile Paralysis.

The occupational therapy department is housed in a fine, one story colonial style building on the campus. It contains large rooms for the various forms of occupational therapy, also facilities for almost any handicraft hobby. The same building also contains a school with a qualified teacher ready to give instruction from kindergarten through the eighth grade, as well as in high school and commercial subjects. This enables patients to maintain their scholastic level while at the Foundation; the medical department advises in each case how much the pupil is physically able to do in addition to his treatment regimen. The furnishings and general equipment, classrooms and the general library at the school are models of cheerfulness and good taste.

For the entertainment and amusement of the entire Foundation family, a playhouse is situated near Georgia Hall, where motion pictures are shown and amateur theatricals can be given. There is a fine nonsectarian Chapel. Several house-keeping cottages are available for the families and friends of patients who may be visiting.

No wonder that with all these facilities and the efficient medical care, Warm Springs has become a Mecca for the handicapped by infantile paralysis from all parts of the United States, Canada, South and Central America and many other parts of the world. Its pathfinding clinical work has exerted a powerful impact on the humanitarian instincts of many millions of the American people. It resulted in the inauguration of a new principle in the social history of mankind: scientific research supported by the people themselves as represented by the National Foundation for Infantile Paralysis. One cannot leave the Warm Springs Foundation without the feeling that its illustrious founder has left here a more lasting memorial than many a statue could ever represent. The "Spirit of Warm Springs" should live on not only ultimately to conquer infantile paralysis but also pos-

sibly to show the way to ameliorate other crippling conditions, such as chronic arthritis.

Physical Medicine in Turkey

By Prof. Dr. A. Laqueur, Ankara, Turkey.

When Kemal Ataturk and his collaborators founded and organized the modern Turkish state, they were able, in contrast to their experiences in other cultural departments, to continue old traditions on the subject of medicine. There existed a Faculty of Medicine in Istanbul since 1827, and in connection with it the Military Surgeon's School at the Gulhane Hospital was well known abroad. Both institutions have been in contact with the medical world of Middle and Western Europe. At the end of the nineteenth and the beginning of the twentieth century, outstanding European physicians, especially Germans, taught there, and many Turkish doctors went abroad for several years study, mostly to Germany or France, by their own initiative or sent there by their government.

The modernization of Turkey, nevertheless, brought many changes in the department of medicine as well as in public hygiene. At the Faculty of Medicine of the University of Istanbul a series of new clinics and teaching institutions was established, and several German professors were appointed. Among these institutions was a large Institute for Radiology, opened in 1935, designed especially for roentgen diagnosis and radium therapy. A special institute for physical therapy was also included, under the direction of Prof. Osman Cevdet Cubukcu who has given lectures on physical therapeutics since 1929. This institute contained complete equipment for electrotherapy and mechanotherapy but no hydrotherapy. Recently it was moved into a new building on the grounds of the Guraba Hospital, where the needed space for hydrotherapy is available.

The instruction for the students in the eighth term is given here by lectures and demonstrations. In about twenty lectures the principles and effects of different physical methods and their indications are discussed as well as their use in different pathologic conditions. Students of the tenth term (Stagiaires), divided in small groups, are given practical exercises in the application of the physical therapy during several weeks. At the end of these "stages" the students have to pass a brief examination. Participation at these lectures is compulsory.

In the new capital of Turkey, Ankara, the large modern public model hospital, erected in 1934, included an institute for physical therapy from the beginning. I

was invited in 1935 to become its director. After my arrival, a wing was added and much modern equipment was installed. The institute consists of a division of Light-Hot Air and Electrotherapy, including high frequency, a division of Mechanotherapy containing a large number of apparatus, including special apparatus for children, and a division of Hydrotherapy. There exists also a special outpatient department and a small clinical division for bed patients. Patients come either through the polyclinic (outpatient department) of the Institute or are referred by other polyclinics or clinical departments of the hospital or by outside physicians. Physical procedures can be administered at the bedside.

In 1945, after nearly ten years of activity, I withdrew from my position as director of physical therapy, and as successor a former assistant and later collaborator, Dr. Fevzi Gunalp, was appointed; he is at present in America for postgraduate study.

Besides the model hospital, there exists in Ankara a large military hospital, consisting of a number of single pavilions. One of these, suitably rebuilt, serves as an institute for physical therapy. It contains complete equipment for hydrotherapy, baths and mud treatment, also for electro-medical treatment, and a large installation for mechanotherapy. A clinical division with thirty beds is situated in the top floor. I served as consultant in the rebuilding and refurnishing. When this new military hospital was finished, in 1940, the Military School from Gulhane was transferred here, and Prof. Nüshet Sakir Dirisu, who had already taught physical therapy at a school in Istanbul was appointed as director of physical therapy. Since the opening of the medical faculty in Ankara in 1946 he has been giving lectures there on the subject.

In the third largest town of modern Turkey, Izmir, in Smyrna, only few doctors are practicing physical therapy, but in the two modern watering places of Turkey, Brusa and in Yalova, there are extensive hydrotherapy installations. Brusa is situated at the foot of Mt. Olympus in Asia minor, while Yalova is not far from Istanbul, near the shore of the Marmara Sea. In the Military Hospital of Brusa military persons and their families from the whole country receive hydriatic treatment in the well equipped physical therapy department under the direction of Dr. Riza Remzi Reman, a pupil of mine. Remzi has made intensive research in balneology and has written a book on Turkish watering places. In Yalova the hydriatic installation functions at the thermal Kurhotel under the direction of the spa physician, usually a

specialist from Istanbul or Ankara.

It would lead too far to enter here on the interesting chapter of the mineral springs of Turkey. Turkey, especially Asia Minor, possesses a great number of mineral springs, mostly thermal with temperatures from 40 to 70 C. and a comparatively low mineral content. Some springs possess a larger quantity of sodium chloride, carbonic acid, sulphur or iron. There are also saline and sulfate waters used for drinking purposes. The equipment of these places is often primitive, but some of them have already been modernized; others are slated to be modernized. These springs are mostly situated in the border of the high plain of Asia Minor and are exceedingly popular, even with the poorer classes. Being close to heavily populated areas, their housing accommodations are simple, and they offer short bathing cures, rating eight to fourteen days and drinking cures taking only, 2-4 days. In cases in which physical treatment is indicated, as in the large group of rheumatic and nerve ailments, there is the possibility of applying a resort cure as a welcome supplement to the other methods indicated for these ailments. In addition, natural sun baths and sand baths at the seashore are very commonly used. During the summer and early autumn the weather is nearly always fine and sunny and permits, therefore, the regular application of this climatic help.

With the exception of the previously mentioned watering places, physical therapy by the use of electromedical application is practiced, mostly in the two big cities, Istanbul and Ankara. In these cities, besides the government hospitals, several other hospitals and nursing homes, also a few private physicians, especially neurologists and internists, own electro-medical apparatus. Some small county hospitals also use some such equipment. But, on the whole, the employment of electrophysical therapy outside the big cities is difficult, owing to the sparse population in the far spread country, the general poverty and the high cost of such apparatus following the second war. Therefore it appears more important to initiate the young doctors through compulsory instruction into the use of physical methods which need no apparatus, as massage and simple hydotherapeutic applications.

Physical therapy in Turkey is an acknowledged special branch of medicine. After three years of assistantship in a physical therapy department and after a written and oral examination, a diploma is given certifying the holder as a specialist in physical therapy. However, as physical therapy as a specialty by itself offers only limited prospects, physicians usually ob-

tain also a diploma in another specialty, such as neurology or internal medicine.

In summary, one may say that physical therapy in modern Turkey has obtained in a relatively short time an independent and outstanding position, in spite of many difficulties due to the geographical structure of the country and to general political situation. The development on this department of medicine is not yet completed. One outstanding need is to inform more physicians of the value and the benefits

of physical treatment. For this purpose, the development of postgraduate courses will be necessary, for the general practitioner is naturally more interested in therapeutic procedures and progress than the student. With the exception of courses for government physicians on the prevention and combating of infectious diseases such as malaria, tuberculosis and trachoma, postgraduate instruction in physical therapy is still merely a project for the future.

Yenisehir, Atatürk Bulvari, 219.

MEDICAL NEWS

American Congress of Physical Medicine Officers, 1948

H. Worley Kendell, M.D., Chicago, President.
O. Leonard Huddleston, M.D., Los Angeles, President-Elect.

Earl C. Elkins, M.D., Rochester, Minn., First Vice-President.

Arthur L. Watkins, M.D., Boston, Second Vice-President.

Robert L. Bennett, M.D., Warm Springs, Ga., Third Vice-President.

Walter M. Solomon, M.D., Cleveland, Fourth Vice-President.

William B. Snow, M.D., New York, N. Y., Fifth Vice-President.

Richard Kovacs, M.D., New York, N. Y., Secretary.

John S. Coulter, M.D., Chicago, Treasurer.

Walter J. Zeiter, M.D., Cleveland, Executive Director.

Marion G. Smith, B.S., Chicago, Executive Secretary.

American Society of Physical Medicine Officers, 1948

President — **Earl C. Elkins, M.D.**, Rochester, Minn.

President-Elect — **Arthur E. White, M.D.**, Battle Creek, Mich.

Vice-President — **Charles O. Molander, M.D.**, Chicago.

Secretary-Treasurer — **Max Newman, M.D.**, Detroit, Mich.

Membership Committee — **Arthur L. Watkins, M.D.**, Boston, Chairman; **Robert L. Bennett, M.D.**, Warm Springs, Ga.; **Frank H. Ewerhardt, M.D.**, St. Louis, Mo.; **Walter S. McClellan, M.D.**, Saratoga Springs, N. Y., and **Milton G. Schmitt, M.D.**, Chicago.

Program Committee — **Walter M. Solomon, M.D.**, Cleveland, Chairman; **Arthur L. Watkins, M.D.**, Boston, and **Gordon M. Martin, M.D.**, Rochester, Minn.

Other Officers Named for 1948

Dr. Roy W. Fouts of Omaha, Nebraska, was elected to succeed himself to serve a term of three years on the financial committee of the American Congress of Physical Medicine.

Dr. Fred B. Moor of Los Angeles, was appointed to succeed himself to serve a six year term on the Editorial Board of the ARCHIVES OF PHYSICAL MEDICINE.

Dr. Frank H. Ewerhardt of St. Louis was appointed to succeed himself to serve a term of seven years on the Board of the American Registry of Physical Therapy Technicians.

Dr. Kretschmer Retires

The University of Illinois College of Medicine announces the retirement of Dr. Herman L. Kretschmer, professor of urology. Dr. Kretschmer was the recipient of the Gold Key of Merit of the American Congress of Physical Medicine.

Dr. Northway Named Assistant Dean

Dr. William Northway, Director of Physical Medicine at Stanford University Medical School, has been named Assistant Dean of Medicine.

Dr. Wilson Reappointed

Dr. George Wilson, Secretary of the Section on Physical Medicine of the Southern Medical Association has been reappointed as expert consultant in physical medicine to the Veterans Administration, Branch No. 4 and The Surgeon General for the Third Army Area.

Dr. James Mennell to University Southern California

Dr. James B. Mennell of London, has accepted an appointment as Assistant Professor of Physical Medicine at the Medical School of the University of Southern California at Los Angeles. Dr. O. Leonard Huddleston, President-Elect of the American Congress of Physical Medicine, is the Director of Physical Medicine.

Recently Dr. Mennell, under the auspices of the Faculty of Medicine, Columbia University, conducted a concentrated course in manipulative surgery at the Columbia Presbyterian Medical Center.

Physical Medicine Expands at Cook County Hospital, Chicago

The Department of Physical Medicine of the Cook County Hospital, Chicago, Illinois, was host to over 500 visitors at its formal opening on September 18. Its expanded quarters occupy the west wing of the seventh floor of the main building.

The Physical Therapy section, under the technical direction of Miss Lorena James, occupies the north half and is divided into 20 treatment booths equipped with a complete assortment of physical therapy apparatus. A section for hydrotherapy equipped with whirlpool baths is a new addition to the department as is also a group of gymnasium apparatus.

The Occupational Therapy section, under the technical direction of Miss Ella V. Fay, occupies the south wing, which is essentially a large sun porch opening onto an open roof garden. A long corridor provides space for shuffleboard. Equipment is available for the various activities used for supervised and graded exercise for the patients. One of the unusual features is a replica of the front portion of a street car which is on the open roof. This is used in training amputees and those using crutches and canes to learn safely to board and alight from the street cars. This is proving very effective.

The department is the result of the efforts of many. Dr. Malcolm MacEachern and Dr. John S. Coulter made a preliminary survey. Dr. Karl Meyer and the administrators of the hospital made the space available and provided the funds for the extensive new equipment obtained. The building superintendent and his men have done an excellent job in providing a light, clean, attractive, and well laid out department.

The department cares for about 250 patients daily. In addition, it provides clinical teaching and experience to the medical students from Loyola University School of Medicine under Dr. I. F. Hummon, Jr., and courses for physicians under the auspices of the Cook County Graduate School of Medicine.

Under an affiliation agreement it also provides clinical experience for students from the following approved schools for occupational therapy: College of St. Catherine, St. Paul, Minn.; Kalamazoo School of Occupational Therapy, Western

Michigan College of Education, Kalamazoo, Michigan; Mount Mary College, Milwaukee; Ohio State University, Columbus, Ohio, and University of Illinois College of Medicine, Chicago.

All patients treated in the department of Physical Medicine are first seen by the attending physiatrists, Drs. Disraeli Kobak and Irwin F. Hummon, Jr., at clinics held twice each week.

The department is quite proud of its present facilities and is open to interested visitors at any time.

Graduation for Physical Therapists

Columbia. — A reception in honor of the graduating class of physical therapists at Columbia University, College of Physicians and Surgeons, was held Aug. 15, 1947, in Maxwell Hall.

Pennsylvania. — Commencement exercises for the class of 1947 of the school of physical therapy, Graduate Hospital, University of Pennsylvania were held Friday, Sept. 12, at the Institute of the Pennsylvania Hospital.

D. T. Watson. — Dean Stanton Crawford, of the College of the University of Pittsburgh gave the principal address at the commencement exercises for the graduating class for physical therapists at the D. T. Watson School, Sept. 26, 1947. Dr. Jessie Wright, Medical Director of the course is a member of the Board of the American Registry of Physical Therapy Technicians.

Council on Physical Medicine

Dr. William E. Grove, otologist of Milwaukee, and Dr. Derrick T. Vail, ophthalmologist of Cincinnati, have been elected members of the Council on Physical Medicine.

Burdick Muscle Stimulator Acceptable

The current designated "stimulator" is a condenser discharge of small capacity controlled by an interrupter. It is not a faradic current. The current is surged by means of a geared mechanism to which a handle is attached for use by the operator. This mechanism is easily controlled and permits the operator to determine manually the rate of muscle contraction as well as the degree. It performs a function similar to the manual manipulation of the "Morton Smart" machine for securing the graduated muscular contractions. This current can be used for stimulation of the muscle having an intact nerve supply. It cannot be used to secure contraction of the partially or totally denervated muscle. Therefore its use is confined solely to treatment of the muscle with an intact nerve supply. — J. A. M. A. 134:875 (July 5) 1947.

Emerson Resuscitator, Military Model, Acceptable

The Emerson Resuscitator, Military Model, is designed to furnish mechanical artificial respiration to victims of asphyxia. It is operated by compressed air. A foot pump compresses the

air. The resuscitator can also be operated by compressed oxygen.

Two types of equipment are available. One model is a resuscitator only; the other has an additional valve which converts it into an inhalator. A transparent plastic face mask with an inflatable rubber cuff is attached directly to the mechanism of the resuscitator. A fabric-reinforced rubber tube $4\frac{1}{2}$ feet (114.3 cm.) long connects the apparatus to the source of compressed gas. — J. A. M. A. 134:782 (June 28) 1947.

General Electric Infra-Red Heat Lamps Acceptable by Council on Physical Medicine

The General Electric Infra-Red Heat Lamps are self contained units and screw into any conventional socket. The conical bulb is coated with aluminum on the inside, making a reflector. The face of one model is made of lightly frosted glass and the other is red glass. The heat radiation from this lamp has therapeutic value, but the firm does not claim any special therapeutic benefit from the frosted or red glass faces (filters). The tungsten filament at the focus of the reflector draws 250 watts. The spectral intensity measurements presented by the company are characteristic of the radiation emitted by any incandescent tungsten.

Van Vechten Thermask Acceptable.

The Van Vechten Thermask provides a means of applying heat to the frontal area of the head and cheeks by controlled electric current. In appearance the appliance resembles a mask, which is attached to the head by means of a ribbon.

The device was investigated clinically by the Council. This investigation revealed that, for its limited purpose of applying heat to a restricted area, satisfactory results were obtained. This form of applying heat is no more beneficial than the use of an infrared lamp, an electric pad or any other form of applying external heat except that it may be more convenient. The device is useful in furnishing a uniform gentle heat. — J. A. M. A. 134:1016 (July 19) 1947.

An Army Career in Physical Therapy

As a result of the passage of recent legislation, the Army now offers to graduates of approved Physical Therapy Training Courses a career which affords unusual opportunities.

Public Law 36 authorizes a Physical Therapist Section in the Women's Medical Specialist Corps of the Regular Army and provides for these officers all the benefits and privileges applicable to male commissioned officers of the Regular Army. This position offers an attractive opportunity for the young woman who is eager to direct her life into channels which will not only be most productive of personal happiness and satisfaction, but which will also insure professional advancement and development.

The War Department has recently authorized

the establishment of a Physical Medicine Service in Army hospitals on the same organizational level as the other major services. Working in well-equipped departments under medical officers who have particular interest and training in this field, Physical Therapists are given opportunities for optimum professional guidance and growth. High standards of performance and alertness are maintained and study programs and conferences are encouraged for all Physical Therapists serving in Army hospitals.

Physical Therapists in the Army may be assigned to general or station hospitals in this country or overseas. Assignments are rotated so that the experience of each individual is varied. Every effort is made to give each officer the chance to develop her individual capabilities and potentialities in so far as the exigencies of the service will permit.

The Physical Therapist in the Army has unequalled opportunities for travel with its attendant cultural achievements and pleasurable experiences. Her overseas assignments provide unusual occasion for orientation to the peoples and customs of foreign lands. Knowledge of professional practices of other countries may be attained first hand. The broader interest and enlightened perspective gained by extensive travel add greatly to the accomplishment of a full and colorful life.

From the economic standpoint, few careers offer advantages equal to those tendered to Physical Therapists by the Army. The financial compensation is above the average for members of this profession. Medical and dental care are factors of some consequence. In addition, retirement privileges far exceed those authorized in civilian positions. In short, an Army career permits the Physical Therapist to maintain an acceptable standard of living which is commensurate with her professional and personal qualifications.

Wherever she travels, her entree into Army circles provides companionship. She may always be a part of the pleasant social life characteristic of Army Posts, both at home and overseas. Few other environments offer comparable recreational facilities and possibilities for entertainment. Valued friendships thrive in the prevailing atmosphere of common interest and in the knowledge that these contacts will be maintained and frequently renewed during a lifetime in the Army.

Tradition throughout the years has bestowed upon commissioned officers of the Regular Army an enviable prestige. This, properly regarded, is a source of pride and satisfaction to those who have chosen this life as a career. The advantages of a career as a Physical Therapist in the Army cannot be mentioned without reference to the wartime as well as to the peacetime program. The record of the Medical Department during the recent war is, by now, well known to all. To be an integral part of such an organization presents opportunities for service and experience which cannot but be of paramount interest and importance to the young Physical Therapist who now has under consideration the various avenues which are open to her.

Physical Medicine in South Africa

Announcement is made of the formation of the South Africa Society of Specialists in Physical Medicine. According to the Secretary, Dr. A. L. Lomey, plans are under way for extensive participation by the group in the Annual Conference in 1948 of the South African Medical Association in Johannesburg.

State Legislation

California. — A. 2681, to amend the law relating to the practice of chiropractic, proposes to define chiropractic as consisting of "any or all acts essential to the application of chiropractic principles. Said acts are directed chiefly to the proposition of adjusting vertebral subluxations for the purpose of reducing obstructive pressure on nerves, where they lie in intervertebral foramina, or pressure on the spinal cord." The proposal would further define the terms "impingement, subluxation and adjustment" as follows: "Impingement is the state of any nerve, or the tissues of the spinal cord or brain, on which there is sufficient pressure to obstruct the transmission of nervous energy. Subluxation is any relation of contiguous vertebrae, of the first cervical vertebra and the occipital bone, of the fifth lumbar vertebra and sacrum or of any osseous articulation in which nerves may be subjected to obstructive pressure. Chiropractic adjustment is the voluntary and specific reestablishment of proper vertebral relationship for the purpose of relieving obstructive pressure on spinal nerves or the spinal cord."

Connecticut. — H. 922, which has become public act 104 of the Acts of 1947, relating to the practice of naturopathy, suspends the provisions of the naturopathic practice act relating to licensure without examination until the adjournment of the 1947 session of the general assembly. S. 133, which passed the house May 28, to amend the law relating to osteopathy, proposes to establish higher minimum requirements and more rigid supervision of the professional practice of osteopathy in the state. S. 169, which passed the house May 26, relating to the practice of chiropractic, proposes to require applicants for certification without examination to be graduates of approved schools, to meet the requirements of the state board of healing arts and to have three years of practice in the state in which they are licensed immediately prior to an application for a Connecticut license, except that persons discharged from the armed forces may have had three years of practice immediately prior to their induction.

Florida. — S. 151, which became law without approval on May 26, amends the law relating to the practice of massage by redefining the meaning of the practice so as to include the use of electrical apparatus.

Michigan. — H. 404, to amend the basic science act, proposes to eliminate from the board of examiners a chiropractic member and to exempt from the terms of the act practitioners of chiro-

practic. H. 405 proposes the creation of a state board of registration and examination in naturopathic medicine. Naturopathy is defined by the proposal as "the art and science of naturopathic medicine as taught by the recognized and accredited schools and colleges teaching the art and science of naturopathy."

Nebraska. — L. B. 389, which was approved May 28, redefines the practice of chiropody by adding to the present definition the following words: "a person practices chiropody who holds himself out as being able to diagnose, treat, operate, or prescribe for any disease, pain, deficiency, deformity or physical condition of the human foot and who shall either offer or undertake by any means or methods to diagnose, treat, operate or prescribe for any disease, pain, deficiency, deformity, or physical condition of the same." The only limitation on the right to perform certain types of surgery would seem to be the amputation of the foot or toes whereas previously chiropodists were unable to make "correction of deformities requiring the use of the knife."

New Jersey. — S. 49 which passed the house April 14, to amend the law relating to the practice of chiropody, proposes to redefine chiropody as follows: "the diagnosis of or the holding out of a right or ability to diagnose any ailment of the human foot, or the treatment thereof or the holding out of a right or ability to treat the same by any one or more of the following means: local medical, mechanical, minor surgical, manipulative and physiotherapeutic or the application of external medical or any other of the aforementioned means except minor surgical and local medical to the lower leg and ankle for the treatment of a foot ailment: not including, however, the treatment of tuberculosis, osteomyelitis, malignancies, syphilis, diabetes, tendon transplantations, bone resections, amputations, fractures, dislocations, the treatment of varicose veins by surgery or injection, the administration of anesthetics other than local, the use of radium, the use of x-rays except for diagnosis, or the treatment of congenital deformities by the use of a cutting instrument or electrosurgery. The term 'local medical' hereinbefore mentioned shall be construed to mean the prescription or use of a therapeutic agent or remedy where the action or reaction is intended for a localized area or part."

Ohio. — H. 982, which passed the senate June 14, proposes to define chiropody as "the diagnosis and treatment of the ailments of the human foot. This shall not confer the right to amputate any part of foot, leg or toes or the use of any anesthetic other than local for the treatment of any constitutional disease."

Pennsylvania. — S. 582 proposes to redefine osteopathic medicine as meaning "a complete and independent school of medicine and scientific system for the preservation of health and the relief and cure of bodily disorders embracing a distinct etiology prophylaxis and therapeutics applicable to all types and conditions of disease which places the chief emphasis on the anatomical and physiological integrity of the body mechanism as being the most important factor in maintaining

the well-being of the human body in health and disease and embraces and includes whatever methods of treatment the needs of patient require."

H. 294, which was approved May 17, amends the law relating to the practice of chiropody by authorizing the state board of medical examiners to adopt rules and regulations permitting in the practice of chiropody the use of such drugs as are necessary to such practice.

South Carolina. — S. 254, which passed the house April 10, was reported as proposing to authorize osteopathic physicians licensed in the state to certify birth and death certificates in the same manner as is now prescribed by law for other physicians. This action should have included the statement that by house amendment of April 9 there was added to the proposal the following proviso: Provided that the osteopaths shall have passed the examination prescribed by the state board of medical examiners as required of other physicians.—*Rep. J. A. M. A.* 134:191 (May 10), 544 (June 1), 615 (June 14) 1947, and 904 (July 5) 1947.

Veterans Administration

One of every 30 veterans in school under the G. I. Bill is studying medicine or related subjects, a Veterans' Administration sampling of school-going veterans disclosed. Of the total of 1,825,000 veterans in schools, colleges and universities on May 1, the survey showed 59,316 enrolled in all phases of medical training. Nearly 53,000 of these veteran-students were in colleges and universities, and the remaining 6,500 were in other types of educational institutions studying nursing, x-ray procedures and related subjects. Most of the veterans in school on May 1—or 1,126,000—were in colleges and universities. The remaining 699,000 were in high schools, trade schools and other institutions at the non-college level. Under the Servicemen's Readjustment Act (G. I. Bill), veterans are eligible for education at Government expense if they served in the armed forces for 90 days or more, part of which was on or after Sept. 16, 1940, and they were released under conditions other than dishonorable. The period of education to which a veteran is entitled depends upon the length of active military duty. He receives one year, plus one month of each month of military service, up to a maximum of four years. While in school, he may receive a subsistence allowance from VA of \$90 a month if he has dependents or \$65 a month if he has none—provided he has no other income.

Veterans Administration services for amputees, the blind and other physically-handicapped veterans will be brought closer to their home towns through prosthetic appliance units in each of VA's 13 branch offices, and 66 regional offices. The service is designed to simplify the purchase of prosthetic devices for veterans and to eliminate much red tape in present procedures. Trained VA employees in each office will give disabled veterans the latest authentic information on new inventions and other developments in

artificial arms and legs, hearing aids, aids for the blind, cosmetic hands and ears, plastic eyes and other devices to assist the physically handicapped.

Disabled veterans also will receive technical advice and counsel in their choice of artificial limbs and other aids.

Strides made by the Veterans Administration in the last year and a half in establishing a first-rate program of medical rehabilitation in VA hospitals were demonstrated when leading medical rehabilitation doctors and administrators from the thirteen VA branch offices throughout the country met to plan for further strengthening of that service.

When it started in January, 1946, there were but twenty-five full-time doctors of physical medicine, 115 qualified occupational therapists and 102 qualified physical therapists to care for the 72,983 patients then in VA hospitals. In the last year and a half the patient load has risen to 92,530, but there are now eighty-one full-time doctors of physical medicine, 531 qualified physical therapists and 432 qualified occupational therapists on duty to meet their rehabilitation needs. This professional staff has also been augmented by 300 instructors in educational therapy, many of whom had served in the Army Information and Education Program; 407 instructors in manual arts therapy and 366 specialists in corrective physical rehabilitation. The latter are a highly selected group of men chosen from the nearly 20,000 physical educators who did outstanding work in physical reconditioning in Army and Navy hospitals during the war.—*Rusk, N. Y. Times.*

Veterans paralyzed from the waist down now can play table tennis with ease from wheel chairs in Veterans Administration hospitals as a result of a specially built table designed for their use. The table is standard except for sideboards 30 inches high that extend above the playing surface and prevent the ball from glancing off the table. Two changes in the rules have been made to fit the needs of these players. The first provides that a serve may not strike the sideboard before it crosses the net; the other change involves a ball hitting the sideboard and then going off the table before it bounces on the table. This shot is scored against the player making it. These tables and other arrangements for athletic activities for paralyzed veterans not only entertain patients but provide an adjunct to their treatment in veterans' hospitals.

Music in Treatment of Disease

With the approval of Surgeon General Thomas Parran of the United States Public Health Service, Dr. R. C. Williams, Assistant Surgeon General has accepted appointment as a member of the Board of Directors of the Music Research Foundation, Inc., a nonprofit organization which has for its purpose the study of the use of music in the treatment of disease. Dr. Williams will act as Chairman of the Executive Committee of the Board of Directors.

There has been marked interest in the use of music in the treatment of disease for a number

of years, and during World War II there was a decided revival of such interest. Much of the leadership in reviving this interest has centered around the work of Frances Paperte at Walter Reed General Hospital, Washington, D. C. Miss Paperte is one of the organizers of Music Research Foundation, Inc., which is now formulating plans for the continuation and expansion of its research activities in this field.

It is proposed that a program of scientific inquiry into the therapeutic use of music be initiated. Selected psychiatrists will conduct investigations into the kind of music which has most therapeutic value and the types of mental patient most responsive to its use. Methods for the integration and utilization of present knowledge by leading mental institutions will be explored; and every effort made to encourage the use of music in the treatment of disease.

In connection with this expanded program, the Music Research Foundation, Inc., will sponsor studies in the field of physics on phases having a bearing on the therapeutic use of music. Through the use of fellowships, it will conduct and initiate special psychological studies. In addition, it will establish grants or fellowships to compile present knowledge of the subject. Consulting committees of qualified scientists will guide each particular field or special area of study.

The Executive Secretary of Music Research Foundation, Inc., is located at 2909 Stanton Ave., Silver Springs, Md. Reprints of scientific and general articles on this subject are now available without cost.

House Committee Approves Pay Boost for Service Doctors, Dentists

The House Armed Services Committee has approved legislation boosting the pay of Army, Navy and Public Health Service doctors and dentists. Medical men now in the services and those entering within the next two years will receive an additional \$100 a month over their regular pay and allowances under the measure. Those rated as specialists in various fields of medicine would, in addition, be given a 25 per cent increase in their base longevity pay. A subcommittee report stated that "civilian practice is so lucrative to a private practitioner that some action must be taken by Congress or there will be insufficient doctors to adequately provide for Army and Navy personnel." The bill excludes young army and navy reserve doctors whose medical education expenses are paid by the government unless they are from the regular services.

A New Medical Periodical

The College of Medical Evangelists in Los Angeles has begun publication of a quarterly to be known as *Medical Arts and Sciences*. The periodical will contain articles which pertain to the practical, cultural, philosophical, experimental, investigative and critical sides of medicine. The leading article in the first issue, by Arthur L. Bietz, Ph.D., entitled "Religion and Health," is

followed by an article in the field of surgery by Dr. Harry A. Davis, associate professor of surgery, College of Medical Evangelists, Los Angeles, one on cerebral anoxia by Dr. Cyril B. Courville, Rumford, Maine, and another on intracranial surgery by Dr. William T. Grant, Los Angeles. The editor in chief is Dr. Walter E. MacPherson, Los Angeles, and the managing editor Dr. Clarence W. Olsen, 312 North Boyle Avenue, Los Angeles. Matters pertaining to advertising should be sent to C. R. MacIvor, Review and Herald Publishing Association, Takoma Park, Washington, D. C.

Physical Medicine at Fitzsimons General Hospital

Interest in physical medicine at Fitzsimons is evidenced by the following papers read at staff meetings at that hospital: "Physical Medicine in the Diagnosis and Treatment of Peripheral Vascular Diseases," by Lieut. W. A. Jones; "Diagnosis and Treatment of Peripheral Nerve Diseases and Injuries Including Receptor End Organs," by Capt. R. L. Lam; "The Present Status of Treatment of Extra Pulmonary Tuberculosis Including Analysis of Streptomycin Therapy," by Col. W. C. Pollock and "The Present Status of Manipulative Surgery," by Lieut. Col. H. S. McBurney.

Occupational Therapy

Miss Wilma West has been appointed Educational Field Secretary of the American Occupational Therapy Association, succeeding Miss Sue Hurt, who resigned. Following more than two years as Assistant in Occupational Therapy Branch of the Office of The Surgeon General, Miss West has been engaged in graduate study at the University of Southern California as the first recipient of the Baruch Fellowship in Occupational Therapy.

State of Virginia Establishes Vocational Rehabilitation Center

The state of Virginia has acquired a portion of the Woodrow Wilson General Hospital, Fishersville, Virginia, for the establishment of a Vocational Rehabilitation Center. The facility is to be operated by the Vocational Rehabilitation Service of the State Department of Education. Services are to be provided designed to meet the particular needs of the severely handicapped. These services will include physical and occupational therapy, functional retraining, training in the use of appliances, medical, psychological, and social services, guidance and counseling, vocational training and selective placement.

It is contemplated that the Center will serve approximately 200 persons during its first year of operation. Plans are being made, however, to serve at a later date approximately 600 persons at one time. Medical services will be under the supervision of Dr. Josephine J. Buchanan, in co-operation with the Baruch Center of Physical

Medicine of the Medical College of Virginia. Members of the medical staff from the Baruch Center will serve as consultants.

Rehabilitation Center to Open in Louisville

The Kentucky Society for Crippled Children will soon open a curative workshop for children and adults in Louisville. This rehabilitation center is designed to assist the orthopedic handicapped patient to obtain maximum use of the injured part and to help him resume his normal place in the community. The types of treatment will be physical and occupational therapy. All treatment will be given only on medical recommendation. A committee has been appointed by the Jefferson County Medical Society to advise and cooperate with the local workshop committee.

Affiliation with Institute for Rehabilitation Program

Announcement is made of the affiliation between Columbia University College of Physicians and Surgeons and the Institute for the Crippled and Disabled to develop a program of rehabilitation and reeducation of the disabled. The new agreement will provide a means for training physicians, technicians, nurses, psychologists, social workers, vocational councilors, educators and those of other related professions. The institute will continue its independent existence. Cooperation with community groups, universities, medical schools, hospitals and institutions in addition to Columbia will be continued and encouraged. Columbia will nominate the medical board of the institute. Dr. Frank E. Stinchfield, associate in surgery at Columbia, will head the institute's medical services as orthopedic surgeon in charge. Two assistant medical directors and a staff of medical consultants will be named to conduct the expanded medical program of the institute.

Gift to Rehabilitation Clinic

In recognition of the work of the staff of the John Sealy Hospital, Galveston, in connection with the Texas City disaster victims, the Monsanto Chemical Company of St. Louis has given a grant of \$25,000 to assist in the development of a Rehabilitation Clinic at the University of Texas Medical Branch, Galveston. Other industrial concerns in the Texas City-Galveston area are also assisting in the development of the project. The clinic will be developed in accordance with the recommendations of the Baruch Committee for Physical Medicine and will involve the services of orthopedic surgery, neurosurgery, plastic surgery, physical and occupational therapy, psychologic guidance, social readjustment and job placement.

Aid for Spastics

A joint committee for research in problems of cerebral palsy has been established by the New York City, Bellevue and Presbyterian hospitals, the city health department, Cornell University Medical College, Columbia University College of

Physicians and Surgeons and the New York University College of Medicine. Its purpose is to conduct research, intensify the development of diagnostic procedures and study of the best way to organize, finance and operate clinics. Committee officers are Dr. Philip D. Wilson, chairman and Dr. William Cooper, secretary.

The sum of \$250,000 is being set aside by the Children's Bureau, Department of Labor, for the development in 1948 of a program to aid juvenile victims of cerebral palsy. New York State will receive \$50,000 from the Children's Bureau to train personnel in the techniques of treating spastics to augment state appropriation of \$25,000. Maryland and Alabama will also receive \$50,000 grants and New Jersey \$30,000. About thirteen states which have made a beginning in this field will receive small amounts from federal funds. The bureau estimates that there are in this country about 175,000 children with cerebral palsy.

Annual Convention National Society for Crippled Children and Adults

The convention of the National Society for Crippled Children and Adults will be held at the La Salle Hotel, Chicago, November 3-5, 1947. Program for Monday will be developed on the convention theme "The Handicapped — a Great National Resource"; for Tuesday on Rehabilitation; and for Wednesday on Cerebral Palsy.

Curative Workshop Helps Handicapped of Wilmington

There is today a nation-wide awakening of community conscience regarding responsibilities toward the disabled and the need for community rehabilitation centers. A splendid example of how these responsibilities can be met through cooperative community action has been demonstrated in Wilmington, Del.

Three years ago, the headquarters of the Episcopal Bishopstead of Delaware was moved from the historic building it had occupied in Wilmington since the late Seventeen Hundreds. Now, as the home of the Delaware Curative Workshop, it has regained its influential role in the lives of many Delaware citizens.

A League member, who was a retired occupational therapist and knew the dearth of rehabilitation facilities in the state, suggested that the League found a curative workshop. Discussions with local hospital boards, physicians, visiting nurses, the State Division of Vocational Rehabilitation, State Board of Health and other groups, confirmed the great need for such a facility.

The workshop's professional staff consists of two registered occupational therapists, two registered physical therapists and two senior occupational therapy students who are receiving clinical training. Within the last few weeks, the workshop has started home service occupational therapy in which the therapist administers treatment within the home for those who are unable to come to the workshop. — *Rusk, N. Y. Times*.

BOOK REVIEWS

CLINICAL HEMATOLOGY. By *Maxwell M. Wintrobe*, M.D., Ph.D., Professor of Medicine, University of Utah, School of Medicine, Salt Lake City, Utah. Formerly Associate in Medicine, Johns Hopkins University, Associate Physician, Johns Hopkins Hospital, and Physician-in-Charge, Clinic for Nutritional, Gastro-Intestinal and Hemopoietic Disorders, Baltimore, Maryland. Second edition, enlarged and thoroughly revised. Octavo, 862 pages, illustrated with 197 engravings and 14 plates in color. Cloth. Price, \$11.00. Philadelphia: Lea and Febiger, 1946.

This second edition of a great work has been enlarged and revised, and is now the outstanding textbook on clinical hematology in the English language. Although for some years textbooks on hematology have been plentiful in foreign languages, the scarcity of authoritative English texts was noticeable. In recent years this gap has been filled by many excellent contributions. This book is a leader in the field. It is complete and authoritative. The bibliography is noteworthy in that it shows great care and thoroughness in preparation and reflects a wealth of clinical background.

The author is not only a hematologist but also a clinician. The clinical application permeates the book, making it a living and vital, as well as a masterly, treatise on a scientific subject. He correlates histology, physiology, biochemistry and pathology and applies them at the bedside. Diagnosis is definitely related to treatment.

Recent research work and new discoveries are given prominent places. He stresses the fact that a new and promising horizon is ahead in the field of research as it is applied to hematology. This optimism is reflected in the introduction in which the author lists the important recent advances as the synthesis of folic acid and the demonstration that it can produce remission in pernicious anemia, recent studies of mineral metabolism and of the porphyrins aided by the isotope techniques, the discovery of the Rh factor and its relationship to transfusion reactions and to erythroblastosis fetalis, and the introduction of the nitrogen mustards in the treatment of Hodgkin's disease.

It is difficult to compare the relative merits of the various chapters, since all are exceedingly thorough and comprehensive. The description of the blood-forming organs and blood cells are detailed and clear. Six chapters have been devoted to complete discussions of the anemias, followed by chapters on polycythemia, the purpuras, hemophilia and other hemorrhagic diseases. The concluding chapters on leukemia, tumors and tumor-like conditions involving the blood-forming organs, agranulocytosis and infectious mononucleosis complete an exact and exhaustive work on hematology.

For reference work on the latest developments in the field, this volume is excellent.

OUTLINES OF INTERNAL MEDICINE. FIVE PARTS. By *C. J. Watson*, M.D., Head, Department of Medicine, University of Minnesota. Fifth Edition. Paper. Price, \$9.00. Pp. 515. Dubuque, Iowa: Wm. C. Brown Co., 1946.

Students appreciate this type of volume. All the subjects embraced by internal medicine are given in a more or less outline style with the headings set apart and with the more important parts of the paragraph underscored. Most of the pages opposite the text are left blank to be used as notes. The various subjects are prepared by different authors which adds to their value. The last part covers the laboratory procedures. The editor's purpose of this work is given in the preface as "primarily a systematic course of reading to be correlated with biweekly class clinics presented during the junior year in medicine." He has succeeded. A similar method could be used to advantage in other departments of a medical school.

INJECTION TREATMENT OF VARICOSE VEINS AND HEMORRHOIDS. By *H. O. McPheeers*, M.D., F.A.C.S. Formerly Director of the Varicose Vein and Ulcer Clinic, Minneapolis General Hospital; Attending Physician, New Asbury, Fairview and Northwestern Hospitals, Minneapolis, Minn.; and *James Kerr Anderson*, M.D., F.A.C.S., Fellow, American Proctologic Society; Clinical Associate Professor of Surgery, University of Minnesota; Attending Physician in Surgery, Minneapolis General Hospital; Attending Surgeon, St. Mary's Abbott and Northwestern Hospitals, Minneapolis, Minn. Third revised edition. Cloth. Price, \$5.00. Pp. 336, illustrated with 86 half-tones and line engravings and one color plate. Philadelphia: F. A. Davis Company, 1946.

The appearance of three editions and one reprinting within eight years reflects the current medical interest in the injection treatment of varicose veins and hemorrhoids. Although at first received with some scepticism, the injection treatment of varicose veins when combined with high saphenofemoral ligation in more extensive cases has been accepted as the ideal method of treatment by the majority of the medical profession. The third edition of this volume, the anatomy, etiology, pathology and differential diagnosis of varicose veins are again amply presented and all phases of the injection treatment and after care are fully discussed and illustrated. As a newer development the deep x-ray treatment of acute and chronic cellulitis of the lower leg and the treatment of stasis, dermatitis and eczema, when

combined with injection treatment, are written up by competent collaborators. The injection treatment of hemorrhoids is presented in a similar sequence, although it is admitted that there is less popular demand for it, as many patients have learned to prefer surgical treatment owing to saving in time and the avoidance of frequent office visits. The injection treatment of hernia has been omitted from this work, because it has not proved to be a success, except infrequently in the hands of the most highly skilled, and then only in specially selected cases. This detailed and authoritative information on a subject of considerable importance will prove most helpful to all interested physicians.

AN INTRODUCTION TO MATERIA MEDICA AND PHARMACOLOGY. By *Hugh Alister McGuigan, Ph.D., M.D.*, Professor Emeritus of Materia Medica, Pharmacology and Therapeutics, University of Illinois, College of Medicine, Chicago; and *Elsie E. Krug, B.S., R.N.*, Science Instructor, St. Mary's School of Nursing, Rochester, Minn. Fourth edition. Fabrikoid. Pp. 556, with 37 text illustrations and 26 color plates. Price, \$3.50. St. Louis: The C. V. Mosby Company, 1945.

The new edition of this book is brought out to keep up with the rapid advances in pharmacology and the twelfth United States Pharmacopoeia. It is written as a text for nurses and contains review questions at the end of each chapter. There are numerous valuable illustrations of technic of administration and also color plates of various plants and preparations. The physiologic effects are adequately covered as well as necessary discussion of indications for use. This book is recommended as a satisfactory textbook for nurses.

ACTIONS OF RADIATION ON LIVING CELLS. By *D. E. Lea, M.A., Ph.D.*, Prophit student of the Royal College of Surgeons, formerly fellow of Trinity College, Cambridge. Cloth. Price, \$4.50. Pp. 402, with 61 illustrations. Cambridge: The University Press; New York: The Macmillan Co., 1947.

This book from the Strangeways Laboratory in Cambridge may well become one of the classics of biophysical literature. The book deals with the fundamental biophysics of radiation. In the text, the author has stressed the effect of X-rays largely because so much of the work that he has to cover is based on work with X-rays. Other radiations, however, have not been forgotten.

The book starts out with a discussion of the physical properties and dosimetry of different radiations. The different types of radiations which are used in the remainder of the book are discussed in this chapter. The general principles on which the effects of radiation might be based, such as ionization, excitation and point heat, are discussed and compared.

Chapter two discusses the chemical effects of the ionizing radiations and some of the basic mechanisms which are possible to explain the biological effects of radiation. Chapter three is

devoted to a discussion of the so-called target theory. This theory has been the subject of considerable controversy and the author guides the reader through the arguments with a sure hand. Chapter four is devoted to inactivation of viruses by radiation and should be studied carefully by anybody who is at all interested in virus diseases. The next three chapters are devoted to the genetical effects and the production of structural changes in chromosomes by radiation. Separate chapters are then devoted to delayed division and lethal effects while some of the mathematics that the author did not want to include in the main text are added as an appendix. Twenty pages of references to the literature and a well-planned index conclude this volume.

It is hard to give an adequate impression of the tremendous amount of material that is covered in this book. It is surprising to see how much material the author can bring together on one page without becoming confusing. For those of us interested in clinical physical medicine, the chapter on inactivation of viruses is undoubtedly the most important one. For those of us who are interested in biophysics in general, this book will be interesting from cover to cover. Biophysics is at present a growing science. Books of this type are among the most powerful growth promoting factors which one can think.

HOSPITAL ORGANIZATION AND MANAGEMENT. By *Malcolm T. MacEachern, M.D., C.M., D.Sc., F.A.C.P., F.A.C.H.A.*, Associate Director, American College of Surgeons and Director of Hospital Activities; Associate Professor, Northwestern University Medical School and Professor of Hospital Administration, and Director of Program in Hospital Administration, Northwestern University. Cloth. Pages 1049. Illustrated. Price, \$8.50. Chicago: Physicians Record Co., 1946.

This book is based on thirty-five years of actual experience in administering hospitals and personal surveys of hundreds of institutions by Dr. MacEachern. It also includes the results of the access to more than fifty thousand individual reports in the files of the American College of Surgeons assembled from twenty-eight annual surveys of hospitals in the United States and Canada. From his long years of experience, his zeal for high standards of hospital administration and his contagious enthusiasm, Dr. MacEachern is better fitted to write a book of this character than any other hospital expert in the world.

This volume with its many forms and charts, its standing orders and valuable checklists is intensely practical. Its contents are indicated by the chapter contents; history of hospitals, the hospital of the twentieth century, promoting and building the new hospital, organization of the hospital, admitting department, medical staff, clinical departments, adjunct diagnostic and therapeutic facilities, nursing department, dietary department, outpatient department, medical social service department, medical records department, the hospital library business department, service

departments, personal management in hospitals, ethics, public education, special hospitals and standing orders.

The author's statements in regard to physical medicine should be of vital interest to all physiatrists. "The Division of Physical Medicine in a hospital consists of the departments of physical therapy and occupational which should be under the supervision of a physician who, preferably is a specialist in physical medicine." . . . "it should be a postwar goal to train and to utilize thoroughly qualified physicians to head this department."

In the chapter "Medical Staff" the author says: "A Minimum of three years of special training is considered necessary for a physician to qualify as a specialist in physical therapy." In addition to having a qualified physician in charge, the department must have well trained technical personnel. Technicians should be registered with the American Registry of Physical Therapy Technicians.

This book is highly recommended to hospital superintendents, physicians, nurses and laymen interested in the operation of hospitals.

HOSPITALS: INTEGRATED DESIGN. By Isadore Rosenfield, Progressive Architecture Library. Cloth. Price, \$10.75. Pp. 302. New York: Reinhold Publishing Corporation, 1947.

This book is the first of a contemplated series of a Progressive Architecture Library. It deals with all phases of hospital design, construction, cost and equipment. The book is based on a lecture series given at the Architectural League of New York under the auspices of the American Institute of Architects and the Department of Public Works of New York. The author was for many years chief architect in charge of hospital planning for the City of New York, and among the results of his planning are such renowned institutions as Memorial Hospital and the Hospital for Chronic Diseases (Goldwater Memorial Hospital) both in New York. With the aid of 23 tables and 263 illustrations, actual photographs as well as floor plans, he presents in 19 chapters the main features of hospital planning, the diagnostic and therapeutic facilities, service departments, special hospitals, etc. Physical medicine, also designated as physical therapy and physiotherapy receives much attention; its treatment areas are described under the novel classification of a "wet section" known as hydrotherapy and a "dry section" referred to as physio or electrotherapy. Among the description of hydrotherapy equipment we find the following gems: "a sitz bath which is seldom omitted, but hardly ever used," also, "an electric hot box which it seems would belong to the dry section, but actually belongs here because one has to take a shower immediately after treatment" and finally, "a colonic irrigation bath which strictly speaking is not hydrotherapy but is conveniently located here because it is a wet and sloppy process; also, later "each cubicle should be wired with both direct and alternating current so as to make

it possible to employ both types of apparatus." The latter statement is evidently due to the fact that, in Manhattan, both forms of current are available to enable the use of equipment dating back to the changeover to alternating current. It is evident that many architects would profit and hospital efficiency will gain if consultants in physical medicine are more generally used. Rosenfield's presentation as a whole fills a definite need in medical literature. The questions and answers appended to each chapter serve to clarify many moot points. Hospital administrators, medical educators, institutional engineers, physicians, technicians and nurses alike will profit by its study.

FOODS: THEIR VALUES AND MANAGEMENT. By Henry C. Sherman, Mitchell Professor of Chemistry, Columbia University, New York. Cloth. Price, \$3.25. Pp. 221. Columbia University Press, 2960 Broadway, New York 27, 1946.

This book, according to the author was written as a companion book to *The Science of Nutrition*, and is about foods as individual and group commodities, not only trade commodities but also "the first essentials of the better life." "Management" is the term which is now generally thought to convey most effectively the whole far-reaching field, extending from each individual's daily use of food to the planning of food production for the better nutrition of all people. As further pointed out by the author the book is written for all who will to read. For everyone, in deciding from day to day what to eat and in what proportions, is making decisions which have interesting and far-reaching effects both on his or her own higher health and efficiency and on such use of food production resources as can make possible the bringing of enough of the right kinds of food for health within the reach of all the people. According to this reviewer not many persons stay within the limits of the proposed weekly allotment per person which is based on a recommendation by the United States Department of Agriculture's Bureau of Human Nutrition and Home Economics as one of its contributions to public education in nutrition and food management. This weekly allotment consists of: milk, five quarts; potatoes, sweet potatoes, four pounds; dry beans, peas, nuts, eight ounces; tomatoes, citrus fruits, one pound, eight ounces; green and yellow vegetables, one pound, eight ounces; other vegetables and fruits, two pounds, five ounces; eggs, four; meat, poultry, fish, one pound, eight ounces; flour and cereals, four pounds, seven ounces; fats and oils, fourteen ounces and sugars, sirups, preserves, twelve ounces. The content is extremely interesting and easy to read. It is hardly necessary to introduce the author but mention should be made that he was the first Chief of the Bureau of Human Nutrition and Home Economics, U. S. Department of Agriculture, 1943-44. In recognition of his researches and public service the Franklin Institute recently awarded him the Franklin Medal, its highest honor. We highly recommend this book.

REHABILITATION OF THE TUBERCULOUS. Proceedings of the Conference on the Rehabilitation of the Tuberculous sponsored by the Office of Vocational Rehabilitation, Federal Security Agency with the Tuberculous Control Division, U. S. Public Health Service, Federal Security Agency and the National Tuberculous Association. Paper. No price. Pp. 138. New York: National Tuberculosis Association, 1946.

This booklet is the result of a conference held in March, 1946. The editors have digested the 350 pages of manuscript into this small booklet. The subjects considered are the functions of the nurse, social worker, educational counselor, occupational therapist and rehabilitation counselor in rehabilitation of patients with tuberculosis. The discussions are pointed and practical. This work should be valuable to those who care for the tuberculous patients and to those interested in the subject of rehabilitation in general.

CARDIOVASCULAR DISEASE IN GENERAL PRACTICE. By *Terence East*, M.A., D.M. Oxon, F.R.C.P., London. Physician and Physician in Charge of Cardiological Department, King's College Hospital. Second Edition. Cloth. Price, 12s. 6d. Pp. 198 with 40 illustrations. London: H. K. Lewis & Co., Ltd., 1946.

A book intended for the general practitioner to help diagnose and treat the common disorders of the heart and circulation. Controversial points are avoided and the author intentionally does not include the findings of the electrocardiogram. The phraseology, terminology and medications suggested are British and it is for the British physician that this volume will be most valuable.

VITAMINS AND HORMONES: ADVANCES IN RESEARCH AND APPLICATIONS. Edited by *Robert S. Harris*, Professor of Biochemistry of Nutrition, Massachusetts Institute of Technology, Cambridge, Massachusetts; and *Kenneth V. Thimann*, Associate Professor of Plant Physiology, Harvard University, Cambridge, Massachusetts. Volume IV. Cloth. Price, \$6.80. Pp. 406. Academic Press, Inc., Publishers, New York, 1946.

This is a scholarly and critical presentation in the biologic and medical aspects of vitamins and the interrelationship to hormone research. The contributions include: The new hematopoietic factors of the vitamin B-complex by J. J. Pfiffner and Albert G. Hogan; nutrition and resistance to infection, the strategic situation by Howard A. Schneider; manifestations of nutritional deficiency in infants by F. W. Clements; effect of B vitamins on the endocrinological aspects of reproduction by Roy Hertz; nutritional therapy of endocrine disturbances by Morton S. Biskind; the thyroid and diabetes by Bernardo A. Houssay; thyroactive iodinated proteins by E. P. Reineke; the protein anabolic effects of steroid hormones by Charles D. Kochakian; and methods of bioassay of animal hormones by Sidney A. Thayer.

There is an ample bibliography at the end of

each contribution, as well as an exhaustive subject and author index at the end of the volume. A number of photographs and graphs illustrate some of the articles. Physiologists, students of nutrition and biologic research workers will find this volume invaluable.

JEWISH LUMINAIRES IN MEDICAL HISTORY. By *Harry Friedenwald*, M.D., D.H.L. (Hon.), D.Sc. (Hon.), Professor Emeritus of Ophthalmology, University of Maryland, and a Catalogue of Works Bearing on the Subject of the Jews and Medicine from the Private Library of Harry Friedenwald. Paper. Price, \$3.00. Pp. 199. Baltimore: The Johns Hopkins Press, 1946.

The first 24 pages of this volume contain an address delivered at the Johns Hopkins University by Dr. Friedenwald, who was not only a most eminent ophthalmologist, but also an able philologist and historian. It enumerates the contributions of such ancient Hebrew physicians in the field of hygiene as Isaac, Maimonides and some of those in the Middle Ages like Amatus Montalto and Lucatus, the list ending with the name of one of the greatest medical minds of modern times, Paul Ehrlich. The main part of the volume lists, on 170 pages, a library of works representing the interests, activities, and contributions of Jews in the field of medicine. Dr. Sigrist, head of the Johns Hopkins Institute of the History of Medicine, wrote the foreword. This is another valuable contribution to medicine inspired by the Johns Hopkins Institute.

COLOR ATLAS OF HEMATOLOGY. By *Roy R. Kracke*, M.D., Dean and Professor of Clinical Medicine College of Alabama, Birmingham, Alabama. Cloth. Price, \$5.00. Pp. 197, with 32 colored plates and 3 plates in black and white. J. B. Lippincott Co., East Washington Square, Philadelphia 5, Pa., 1947.

This volume does not replace the famous and larger work of this author but is a book designed for medical students, laboratory workers and general practitioners of medicine. The color plates are as near perfection as can be secured on a printed page. In the illustrations the author uses the Wright's stain exclusively. The first part of the book covers the cells of normal blood with other sections on the various blood diseases such as the anemias, leukemias and hemorrhagic diseases. Brief, clear, clinical descriptions of blood diseases accompany the colored plates. Consideration is also given to blood parasites, infections mononucleosis, Hodgkin's disease, polycythemia vera and erythroblastosis foetalis. The opening chapter is definition of hematologic terms and the last three chapters are blood pictures in various laboratory animals, hematologic technic and summary of hematologic findings.

This work meets the need as a guide and reference book for students and the many physicians who do their own blood smear examinations. The author has presented the material briefly without sacrificing comprehensiveness and the publisher has cooperated by issuing a book of excellent craftsmanship.

PHYSICAL MEDICINE ABSTRACTS

Serratus Magnus Palsy. With Report of Five Cases. Francis C. Ansanelli.

J. Nerv. & Ment. Dis. 105:231 (March) 1947.

Presence of paralysis of the serratus magnus muscle is not so frequently detected as the more commonly known muscle palsies. Inclusion of a few uncomplicated tests in the neurologic examination, particularly in those persons who present histories of symptomatology in the shoulder region or upper extremity, would lead to more frequent and earlier diagnosis of serratus palsy.

Particular stress was given in each case report to the principal tests that would reveal a serratus magnus paralysis. As noted in each case, extension of the upper extremities forward consistently brought out the winging of the scapula. The vertebral border of the scapula projected backward 2 to 4 cm. from the chest wall. Secondly, there was an inability in each case to elevate the extended arm higher than the horizontal level or above and to the side of the head. These two tests would be sufficient to make a diagnosis of serratus palsy. However, there are other phenomena that were commonly observed in each of the above cases and that would be present in other cases of this same type. Added signs would include the closer proximity to the spine of the vertebral border and inferior angle of the scapula on the affected side, particularly evident when the arm is held to the horizontal level sideways; ability for the patient to elevate the arm in extension to the side of the head when the examiner imitates the action of the serratus magnus muscle by pushing the scapula upward and forward with his hand; depression of the shoulder as compared to that of the opposite side; and frequently the inability to maintain the hand in such functions as washing the back of the neck or combing the hair on the back of the head. Although at times the trapezius muscle may be involved, significant winging of the scapula is mainly serratus magnus failure.

The Effect of the Local Reduction of Temperature on Scald Burns in the Rat. Hamilton Baxter, and Robert H. More.

Ann. Surg. 125:177 (Feb.) 1947.

In spite of the increasing interest in hypothermic therapy in a variety of conditions, only a few investigators have studied the effects of local hypothermia on the healing of thermal burns.

Fay and Allen, Crossman and Safford state that hypothermia of burned areas results in decreased pain, edema, exudation, infection and tissue damage. They also report that the burns treated by local cooling heal with a pliable scar and without much contracture. Fay does not state the basis for his conclusions but Allen, Crossman and

Safford report three cases of thermal burns treated by the local application of ice bags, which were gradually withdrawn during the first week. Their impression was that these burns improved more rapidly than had occurred in their experience when burns were not cooled. In the few cases treated by these investigators, controls were apparently not used. The effect of general cooling in burn and/or traumatic shock has been studied experimentally by Blalock, Sellers and Willard, Elman, et al., and others. Rose has described the clinical application of cooling burned patients by placing them in a tub of water at temperatures of 70 F. On the other hand, according to the authors there are no reports in the literature of experimental work where the effect of the local application of reduced temperatures on thermal burns has been studied over an extended period of time, with the object of examining the effect of hypothermia on the reparative processes. Recently, Large and Heinbecker have reported that the healing of experimental wounds is delayed by local cooling and that the amount of lag is proportional to the length of the cooling period. However, Sano and Smith have shown that under reduced temperatures, fibroblasts in tissue culture formed smaller, more compactly placed cells with less intercellular material than tissue cultures of fibroblasts at 37.5 C. They believed, on the basis of these observations, that granulating surfaces so treated would have finer and less retracted scars. They decided that the optimum temperature was between 25 and 30 C. Nemoto has stated that while maximum growth of fibroblasts cultured *in vitro* occurs at 39 C. the rate diminished with decrease in temperature until no growth occurs at 20 C.

Poliomyelitis: The Physician's Approach. Lee E. Sutton.

South. M. J. 40:494 (June) 1947.

As soon as the diagnosis is made the patient should be put to bed and should remain there during the acute stage. The bed should be so constructed that the patient can lie comfortably on his back in a restful position.

When there is stiffness, spasm, or pain, heat may be applied for relief. The heat may be either moist or dry. Moist heat is preferable but requires more nursing care. Dry heat can be given by using a hood rigged with electric bulbs placed over a patient. There are other ways of applying dry heat.

At the present time the most popular way of applying moist heat is through the application of hot blankets from which the water has been wrung.

Gurewitch and others applied moist heat by placing the patient in a water bath at 104 F.

for six immersions daily at fifteen to twenty minutes each, with results in their opinion are just as good as those obtained by hot packs.

Extra salt must be given the patient when he sweats a great deal to make up for what is lost through sweating. Recently hypertonic solutions have been given with the idea of dehydrating the central nervous system. The author did not find any definite advantage in the use of prostigmine.

It must not be forgotten that poliomyelitis patients, particularly older children and adults, are very much worried about themselves. Knowing that they have the disease they immediately picture the cripple whom they knew who had had it. They need psychologic care.

In the convalescent or chronic stage when the pain has left physical therapy should play a large part in therapy. Muscle training and education and graded exercises should be given. Activities must be regulated. Muscles must be protected from overstretching. The orthopedic surgeon should use braces and splints to prevent overstretching of muscles and for the prevention of deformities. When improvement ceases, operations are to be performed when practical to give the patient increased mobility. The occupational therapist has his part to play in rehabilitating the patient.

Isolation of Poliomyelitis Virus From the Throats of Symptomless Children. Howard A. Howe, and David Bodian.

Am. J. Hyg. 45:219 (March) 1947.

Poliomyelitis virus was isolated from the throats of one of 3 patients with poliomyelitis and from one of 6 juvenile family contacts, but not from 5 adult familial, 7 juvenile or 6 adult extra-familial contacts of these cases. Virus was present in the throats of at least two of 28 healthy children from a neighborhood playground. One year later these children were shown to have antibody against the viruses isolated from them. The method, here employed, of testing pools of throat swabs is thought to have been a poor one because of the increased probability of encountering antiviral substances: hence only the positive results can be stressed.

Environment and Fatal Heat Stroke: Analysis of 157 Cases Occurring in the Army in U. S. During World War II. Elizabeth Schickele.

Military Surg. 100:235 (March) 1947.

Schickele analyzes 198 cases of heat fatalities suffered by soldiers in training in the United States from 1942 to 1944 and made available by the Army Institute of Pathology. From these, 157 were selected in which no cardiac or other disease or other effect which would predispose to increase in body temperature could be found, and in which therefore death might be presumed to have been due only to the effects of exposure to heat. Heat deaths are found to be caused by the heat load, as determined by climate, activity and body build. These factors cannot be considered separately but must be treated as components of

the total heat stress. A considerable amount of the variation of the weather conditions under which individuals became ill may be attributed to the interaction of all factors influencing heat stress. "Rapid acclimatization" of one week or ten days cannot be expected to confer complete immunity to heat injury for men who are working in the sun during the heat of the day, when weather conditions exceed those of the "heat death line." One-third of the patients who died had spent a month or less in the heat before death occurred, with as many deaths after four weeks' exposure as after one week's exposure. Incidence fell off rapidly for longer acclimatization periods. Susceptibility to heat stroke appears to be particularly high among persons acclimated to an atmospheric cooling power above a certain level (about 600 calories hourly per square meter of body surface) when they are exposed to an atmospheric cooling power reduced below this level. A map is drawn showing three cooling power zones in the United States. In the most northerly, the heat stress on the average is apparently not sufficiently high to confer acclimatization for work in the sun when conditions are more severe than those of the "heat death line." Persons living in this zone will therefore be particularly susceptible to heat injury during unusual heat waves or excursions to hotter climates. Most fatalities associated with heavy exercise occur at relatively low temperatures, when the total heat stress is commonly underestimated.

The Contribution of Physical Medicine. A. R. Neligan.

Brit. J. Phy. Med. 10:38 (March-April) 1947.

The field of physical medicine has increased during recent years.

Now it is chiefly to the chronic sick that physical methods of treatment make their great contribution. For instance, the teaching to patients of progressive exercises, in convalescence after operation or acute illness, not only prevents unpleasant complications but sends them home in an advanced stage of convalescence.

Active or passive movements are necessary for invalids confined to bed and in treating the sequelae of disease of or injury to the locomotor system such as arthritis, paralysis and fractures. Passive movements and faradism only are needed in the acute stage.

The chronic conditions in which well directed massage and minor manipulation are the best method of relief, are rheumatic disorders and the results of injury to muscles, tendons and joints; they include also fibrositis of the subcutaneous tissues.

In order to prevent his more or less rapid physical and intellectual deterioration, it is well to provide the cooperative chronic invalid with pastimes and better still with regular work. The way may be through diversional therapy and the simplest domestic tasks or through occupational therapy, and for some it may be vocational training in the curative workshop and the sheltered factory.

Infra-red rays and radiant heat for local treatment are simple in action and economical of attention, as compared with diathermy. The latter can be reserved for deep-seated conditions, such as arthritis of the spine, hip or knee and other chronic conditions. Radiant heat has found a new use in indirect heating of the blood by treatment of the trunk in occlusive conditions of the arteries of the extremities.

Galvanism is analgesic in neuritis, trophic to denervated muscles. Ion transfer with metallic salts is used in a number of chronic lesions of the skin and mucous membrane, and using histamine is of value in chronic rheumatism and in occlusive conditions of the arteries.

Refrigeration in Surgery of the Extremities. William J. Pickett.

Illinois M. J. 91:74 (Feb.) 1947.

Allen in 1941 was impressed by the fact that gangrene of an extremity was hastened by application of heat, and delayed by the application of cold. Lowered temperatures diminish oxygen consumption in the tissues and inhibit cellular damage from oxygen want.

Stafford and Nathanson studied, (1) the optimum temperatures desired for refrigeration, (2) the duration of temperatures required for anesthesia, and (3) the minimum temperatures allowable to avoid damage to tissue cells. This was found to be (1) 57 F. to the toes, 36 to 38 F. of the calf while the deep temperatures were found to be somewhat higher. (2) Three hours duration was found to be the average time required. However, this was somewhat determined by the size of the limb. A finger could be anesthetized in fifteen minutes. (3) It was observed that a temperature of 40 or below will produce frost bite if the extremity is too rapidly returned to room temperature.

Ebin has shown that the inferior vena cava of the cat can survive a temperature of -70 F. Spermatozoa may survive a temperature of -260. The tissues of a mastodon unearthed in Siberia after thousands of years could be eaten by dogs. Bacteria have been frozen in liquid helium at -450 F., yeast cells at -300 F. without apparent injury.

Temporary Complete Paralysis of Both Recurrent Laryngeal Nerves Due to an Extension Cast Applied for Scoliosis. Alexander F. Laszlo.

Ann. Otol. Rhin. & Laryng. 56:216 (March) 1947.

Because the recurrent nerve is especially vulnerable, many cases are encountered in which temporary or permanent paralysis occurs as a result of pressure on it. This condition may develop after an operation on the thyroid gland, when the nerve may be caught in a hemostat, or it may develop as a result of a hematoma occurring after an operation, or it may be due to mediastinal tumors, enlarged lymph glands, or an enlarged heart. There are also many cases in which no cause is apparent. Stretching of the nerve may

also damage it, although the amount of such damage is not known, and the authors do not agree on the subject. For instance, Lahey denies its damaging influences, while Heyd takes the opposite view. In the case presented here, external pressure combined with a stretching of the neck caused the paralysis of both vocal cords. No similar case has been found in the literature.

The complete recovery of the patient can be attributed to two facts. First, the timely removal of the cast relieved the nerve from the combined pressure and stretching and gave it a chance to reestablish its function. Second, while the pressure was uniform and of comparatively long standing, it was not localized on any special point on the nerve. It is also interesting to note that lobar pneumonia developed in spite of the administration of large doses of penicillin and sulfathiazole, but responded promptly to sulfadiazine.

Electrotherapy in General Practice. L. D. Bailey. *Practitioner* 94:197 (March) 1947.

Electrotherapy in private practice should be undertaken only by those who have a clear understanding of the physical properties of the agents they are employing and of the physiologic effects of these agents on the living tissues of the human body. The physical agents with which we have to deal in electrotherapy are (1) electrical currents, direct, alternating and oscillating; (2) heat; (3) light; (4) certain wavelengths in the electromagnetic field outside the visible spectrum.

The constant current, commonly known as the galvanic current, has several uses. It must be understood that this current traverses the tissues by regular "ionic" movement of salts in solution in the body and that during its passage it meets with a certain amount of resistance, the most resistant tissue in this case being the skin.

Histamine is most conveniently administered by the application of histamine jelly or ointment (sometimes known under the proprietary name of "imadyl"). This can be lightly rubbed into the skin, preferably with cotton-wool or a rubber glove to protect the operator and over this are placed the usual sixteen layers of lint soaked in normal saline and the positive electrode. The cathode soaked in 2 per cent sodium salicylate may then be placed over the chief site of referred pain and a current of 3, 4 or 5 ma for five to ten minutes passed daily for a week, or three times weekly for two weeks, and the result noted. If there is no improvement in the fibrositic condition noticed after six treatments, it is useless to continue with this type of medication. Besides fibrositis and neuritis other conditions which will greatly benefit from histamine ionization are vascular deficiencies, such as Raynaud's disease, acrocyanosis and early cases of arteriosclerosis.

Alternating currents may be of high or low frequency, that is to say, a current as used for medical purposes may alter its direction of flow from 50 to 50,000,000 times per second. Dealing first with low frequency alternations the currents chiefly employed are the sinusoidal current and

the faradic current. The sinusoidal current in most modern apparatus conforms to the periodicity of the main current supply suitably reduced in voltage for the apparatus employed. It stimulates both muscle and skin nerve endings and can therefore be used to produce either muscle contractions or skin stimulation, but owing to its somewhat painful effect when used at sufficient strength to cause muscle contraction, it is not as a rule used for this purpose, and is definitely inferior in action to the faradic current. Its chief use, like the interrupted galvanic current, is for circulatory disturbances, such as general impoverished circulation in the extremities, Raynaud's and Bazin's disease.

The faradic current has three principal uses: (a) Muscle stimulation; (b) sensory nerve stimulation; (c) electrodiagnosis.

Oscillating currents, or currents of high frequency which alter their direction of flow from anything between 5,000 to 1,000,000 in long wave diathermy and to 50,000,000 times per second in short wave therapy, owe their therapeutic effects to the generation of heat in the tissues.

Although the patient appreciates the warmth of the current in the skin it is a poor criterion of the amount of heat produced in the deeper tissues, such as fat and bone, and for this reason deep-seated burns may occur which are not immediately evident. This is, doubtless, the chief danger of diathermy and short wave applications. Other untoward effects may be dizziness if the treatment is administered near the brain, and syncope if a large area of the body is being treated. Although these treatments may be given with good effect to the whole body for the amelioration of symptoms, such as headache, flushing and vertigo in cases of high blood pressure, they should be administered very cautiously in patients suffering from abnormally low blood pressures.

Heat, light, infra-red and ultraviolet irradiations may be considered together as they have all the physical properties in common. That is to say, these rays are either (a) absorbed, (b) transmitted, (c) reflected, or (d) refracted, according to their wavelength.

Causalgia. A Review of Its Characteristics, Diagnosis and Treatment. John W. Kirklin; Arthur I. Chenoweth, and Francis Murphey.

Surgey 21:321 (March) 1947.

It is the purpose of this paper to review an experience with fifty-two patients suffering from causalgia. In such a study of causalgia, it is imperative that one establish criteria on which the diagnosis can be made. As remarked by Pollock and Davis, there is some confusion as to what constitutes a case of causalgia. The original description of the syndrome, by Mitchell, Morehouse and Keen, is quite specific. In accordance with this original description and with the data gathered from these studies, the authors have formulated a rather strict definition of this condition, which has been employed in their consideration of cases.

They consider causalgia to be a clinical syndrome associated with a lesion of a peripheral nerve containing sensory fibers, manifested by pain in the affected extremity; this pain is usually of a burning character and is usually located in an area corresponding in general to the cutaneous distribution of the involved nerve. An integral characteristic of this pain, one whose presence is necessary in order to make the diagnosis, is its accentuation by certain disturbing features in the affected environment of the individual. The pathogenesis of the syndrome is not known. It is not certain that causalgia occurs only in incomplete anatomic lesions. The data on fifty-two cases of causalgia and nine of atypical post-traumatic painful states are reviewed. The clinical characteristics of causalgia are enumerated. There are cases of post-traumatic painful extremity associated with a lesion of a peripheral nerve which differ from true causalgia to varying extents; occasional cases are distinguished from this syndrome only by their failure to be aggravated by disquieting factors in the environment of the individual. The pain of causalgia is usually relieved or abolished by adequate sympathectomy. There is no relation between the completeness of the relief and any known factor. Resection of the neuroma and glioma of the involved nerve, particularly in the lower extremity, occasionally provides relief of the causalgia.

Effects of Radioactive Phosphorus (P^{32}) on Normal Tissues. R. Platt.

Arch. Path. 43:1 (Jan.) 1947.

Platt reports 43 cases in which tissue changes produced by radiophosphorus were studied microscopically including cases of various forms of leukemia, Hodgkin's disease, multiple myeloma, lymphosarcoma and melanoma. In almost every therapeutic application of radiation, normal tissues are affected as well as the intentionally irradiated focus of disease. The beta emanations of radioactive phosphorus produce characteristic changes in many body tissues, which vary in intensity but are similar to those produced by other types of radiation. Prominent specific features are varying degrees of cellular death, abnormal mitoses producing giant irregular nuclei, fibrosis, hyalinization of collagen and vascular alteration characterized by thickening and hyalinization of small blood vessels. There is selective localization of larger quantities of radioactive phosphorus and greater injury in the tissues most often involved by the neoplastic cells of malignant lymphomatoses and myelomatoses, i. e., marrow, liver, spleen and lymph nodes. Changes were also demonstrated in the lungs, kidneys, gastrointestinal tract, ovaries and testes. The author thinks that serious consideration must be given to the changes in the testes and the ovaries of patients who are in the reproductive period of life because observation of these organs confirms the possibility that spermatogenesis and oogenesis may decrease or disappear, with development of sterility, in young persons given radiophosphorus.